16

# NATIONAL INDEX

# OF

# AGRICULTURAL

# FIELD

# EXPERIMENTS

## VOL. 9 PART 3

## MYSORE

1960—65

ICAR

Published by
INSTITUTE OF AGRICULTURAL RESEARCH STATISTICS
(INDIAN COUNCIL OF AGRICULTURAL RESEARCH)
NEW DELHI-110012

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# FOREWORD

The I. C. A. R. has adopted the 'Co ordinated approach' to crop improvement as its strategy in agricultural research. This approach is based on the principle of giving high priority to problem solving research and for the purpose an intimate knowledge of research in progress and trends of results is very essential. To give impetus to this approach, I. C. A. R. started a scheme for collecting data of all field experiments conducted in the country. It was aimed at compilation of agronomic experiments in the country, with a view to indicate the gaps in the knowledge and to avoid duplication. The scheme entitled : "National Index of Field Experiments" is running under the Institute of Agricultural Research Statistics which has rendered a very valuable service by preparing compendia of agricultural field experiments conducted in the country. Two series of the compendia containing results of about 7,200 and 12,000 experiments conducted during the periods 1948-53 and 1954-59 respectively have already been published by the Institute. The present is the third series of compendia and is expected to contain the results of about 18,000 experiments conducted during the period 1960-65.

The number and the types of experiments have been increasing at a fast rate. Further, many of the experiments were being repeated over a number of years. The conclusions drawn from such experiments should take into account the seasonal variations. For this purpose, it was necessary to carry out consolidated analysis of results over years. Thus, the task of compilation, analysis and interpretation of results of experiments being covered in the third series became more formidable compared to those covered in the earlier two series.

The preparation of this compendium has been possible by the whole-hearted co-operation of State Departments of Agriculture, Agricultural Universities and Central Research Institutes who ungrudgingly made the results of their experimental research available. My thanks are due to various officers of these institutions for participating in this work.

I hope that the present series will be followed by periodical publications of similar compendia for later years in order that the availability of results of scientific experiments in agriculture in India may be maintained up-to date in a consolidated form.

B. K. SONI
*Deputy Director General (AS)*
*Indian Council of Agricultural Research*

New Delhi,
January 1, 1973.

# PREFACE

The present set of volumes form Part III in the series of compendia of Agricultural Field Experiments being published under the project of National Index of Field Experiments. Volumes comprising in Parts I and II of the series pertaining to the periods 1948-53 and 1954-59 were published in 1962 and 1965 and contained the results of about 7,200 and 12,000 experiments respectively. The present volumes include results of experiments conducted during the period 1960-65. During the last decade there has been an enormous increase in agricultural research and experimentation, so much so that, for the period 1960 – 65 to which the present volumes refer, results of about 18,000 experiments are available.

Like the earlier two series, the compendium for Part III is divided into 15 volumes, one each for (1) Andhra Pradesh, (2) North-Eastern Region (Assam, Manipur, Nagaland, Meghalaya, Tripura, Arunachal Pradesh and Mizoram), (3) Bihar, (4) Gujarat, (5) Kerala, (6) Madhya Pradesh, (7) Maharashtra, (8) Mysore, (9) Orissa, (10) North-Western Region (Punjab, Haryana, Jammu & Kashmir and Himachal Pradesh), (11) Rajasthan, (12) Tamil Nadu, (13) Uttar Pradesh, (14) West Bengal and (15) All Central Institutes. A departure has, however, been made in the presentation of the material contained in each volume. Whereas the results of individual experiments were presented in the volumes of previous series, the present series contains results of pooled statistical analysis of experiments that were conducted for two or more years and concluded during the period 1960-65. In respect of those experiments conducted only for one year, and also those conducted for more than one year but were continuing beyond 1965, the results of individual experiments have been presented

The work under the scheme was carried out at the Institute of Agriculturale Research Statistics. Collection of data from different research stations, their scrutiny and preliminary analysis were carried out in successive periods under the charges of Shri T.P. Abraham, Assistant Statistical Adviser, now Joint Director, Central Statistical Organisation ; Dr. B.N. Tyagi, Senior Statistician, Now Joint Director of Agriculture (Statistics), Uttar Pradesh and Shri M.G. Sardana, Senior Statistician, now Officer-on-Special Duty, Central Statistical Organisation. Shri O.P. Kathuria, Junior Statistician, now Statistician in Indian Agricultural Research Institute was also associated.

Preparation of material for inclusion in the third series of compendia volumes and their printing was carried out under the guidance of Shri K.S. Krishnan, Senior Statistician. Shri R.K. Khosla and Shri P.N. Soni, Junior Statisticians, were responsible for the actual working of the scheme till October 1973 and thereafter respectively.

The collection of data of experiments from various research stations was done by the regional staff of the Institute placed in different States. They deserve to be congratulated for the hard work they have put in. The tabulation of the large volume of data involved was facilitated by the assistance rendered by the staff of the computer centre located at the Institute. S/Shri P.P Rao M.P. Saksena, M.L. Sahni, A. K. Mukherjee, S. L. Garg, R.K. Jain, H.C. Jain, G.V.S R. Krishna, J.K. Kapoor, D.K. Gulati, D.P. Singh, Mahender Singh, Kuldip Singh and S.S. Kutaula, statistical staff of the Institute deserve mention for the careful and painstaking work in the analysis of data, combination of results of similar experiments and proof reading of the compendia volumes.

Thanks are due to the State Departments of Agriculture, the Central Institutes and the Agricultural Universities who made the data of the experiments conducted under their jurisdiction readily available to the staff of the Institute. The I. A. R. S. acknowledges with thanks their willing co-operation without which the consolidation of the results would not have been possible. The Institute is also thankful to various officers in the State Departments of Agriculture and Agricultural Universities who worked as Regional Supervisors for the project from time to time and provided guidance to the regional staff working in the scheme. The list of the names of the regional supervisors and regional staff of the project is given on the following pages.

D. SINGH
*Director*
*Institute of Agricultural Research Statistics*
( *I. C. A. R.* )

New Delhi,
June 1, 1974

## Regional Supervisors and Regional Staff of the National Index of Field Experiments

| Sl. No. | Region & Headquarters | Statistical staff from the Institute of Agricultural Research Statistics | Regional Supervisor |
|---|---|---|---|
| 1. | Andhra Pradesh (Hyderabad) | 1. Shri C. H. Rao<br>2. Shri G. V. S. R. Krishna<br>3. Shri P. R. Yeri | 1. Shri P. Govinda Rao, Head of the Agri. Res. Instt.<br>2. Shri S. Vittal Rao, H. Q. Dy. Director (Research) |
| 2. | Assam (Shillong) | 1. Shri A. Sinha<br>2. Shri K. D. Saha | 1. Shri U. C. Borah, Research Officer (Stat.) |
| 3. | Bihar (Sabour) | 1. Shri R. K. Jain<br>2. Shri S. M. G. Saran | 1. Shri G. P. Singh, Statistician |
| 4. | Gujarat (Ahmedabad) | 1. Shri S. P. Doshi | 1. Dr. D. K. Desai, Dy. Director of Agriculture (Stat.)<br>2. Shri J. B. Trivedi, I/C. Dy. Director (Stat.)<br>3. Shri R. L. Shah, Dy. Director of Agriculture (Stat.) |
| 5. | Kerala (Trivandrum) | — | 1. Shri N. George John, Research Officer<br>2. Shri G. Rama Chandran Nair, Research Officer<br>3. Shri K. George, Research Officer |
| 6. | Madhya Pradesh (Bhopal) | 1. Shri Rama Rao Patil<br>2. Shri S. S. Kutaula | 1. Shri A. G. Khare, Dy. Director of Agriculture (Stat.) |
| 7. | Maharashtra (Poona) | 1. Shri P. R. Yeri<br>2. Shri B. Ramakrishnan | 1. Shri V. G. Sharma, Sr. Statistician<br>2. Shri G. C. Shaligram, Dy. Statistician<br>3. Shri D. T. Sawant, Asstt. Statistician |
| 8 | Mysore (Bangalore) | 1. Shri K. A. Balakrishnan<br>2. Shri P. T. N. Nambiar | 1. Dr. N. P. Patil, Director of Research |
| 9. | Orissa (Bhubaneswar) | 1. Shri Rama Rao Patil | 1. Shri B. Mishra, Dy. Director of Agri. (Hq.)<br>2. Shri A. Mishra, Chief Statistician |

| | | | |
|---|---|---|---|
| 10. | Punjab, Haryana, Himachal Pradesh, Jammu & Kashmir (Ludhiana) | 1. Shri B. L. Kaistha<br>2. Shri U. N. Dixit<br>3. Shri D. L. Manocha<br>4. Shri M. S. Batra<br>5. Shri D. P. Singh | 1. Shri P. S. Sahota, Director of Crop Insurance<br>2. Shri Darshan Singh, Asstt. Statistician<br>3. Shri M. S. Pannu, Statistician, Department of Agriculture<br>4. Dr. D. Raghavarao, Prof. & Head, Dept. of Maths. & Stat., P.A.U., Ludhiana |
| 11. | Rajasthan (Jaipur) | 1. Shri N. K. Ohri<br>2. Shri C. H. Rao | 1. Shri H. C. Kothari, Dy. Director (Statistics), Department of Agriculture |
| 12. | Tamil Nadu (Coimbatore) | 1. Shri P. Narayanan<br>2. Shri M. V. George | 1. Shri K. R. Nagaraja Rao, Secretary, Research Council<br>2. Dr. K. Ramakrishnan, Associate Dean<br>3. Dr. D. Daniel Sunderaraj, Principal |
| 13. | Uttar Pradesh (Lucknow) | 1. Shri S. N. Bajpai<br>2. Shri M. P. Saksena<br>3. Shri G. N. Bahuguna<br>4. Shri O. P. Sharma<br>5. Shri R. Sharma<br>6. Shri C. B. Tiwari<br>7. Shri R. S. Singh<br>8. Shri A. C. Srivastava | 1. Dr. K. Kishen, Jt. Director of Agriculture (Statistics)<br>2. Shri K. P. Avasthy, Officer-on-Special Duty |
| 14. | West Bengal (Calcutta) | 1. Shri A. K. Mukherjee<br>2. Shri A. Sinha | 1. Shri S. N. Mukherjee, Dy. Director of Agriculture (Statistics) |

# ABBREVIATIONS COMMON TO EXPERIMENTS ON ANNUAL AND PERENNIAL CROPS AND EXPERIMENTS ON CULTIVATOR'S FIELDS GIVEN IN EXPERIMENTAL DATA

Crop :—In the top left corner, is given the name of the crop on which the experiment is conducted. Within brackets along side the crop is mentioned the season wherever the information is available.

Ref :—Against the sub-title 'Reference' is mentioned the name of the State, the year in which the experiment is conducted and the serial number of the experiment for that year is given in brackets.

Abbreviations adopted for States are as follows :

1. A.P. — Andhra Pradesh
2. As. — Assam
3. Bh. — Bihar
4. Gj. — Gujarat
5. H.P. — Himachal Pradesh
6. Hr. — Haryana
7. J.K. — Jammu & Kashmir
8. K. — Kerala
9. M.P. — Madhya Pradesh
10. Mh. -- Maharashtra
11. Mn. — Manipur
12. Ms. — Mysore
13. N.L. — Nagaland
14. Or. — Orissa
15. Pb. — Punjab
16. Rj. — Rajasthan
17. T.N. — Tamil Nadu
18. Tr. — Tripura
19. U.P. — Uttar Pradesh
20. W.B. — West Bengal

For the experiments conducted under the schemes sponsored by the Indian Council of Agricultural Research, like the All India Co-ordinated Agronomic Experiments (Model Agronomic Experiments and Simple Fertilizer Trials) scheme, no serial numbers have been given at the source as the data of these experiments were collected at the headquarters (New Delhi). In such cases, the abbreviation MAE or SFT is given in the bracket against the year in which the experiment is conducted.

Site & Centre :—Name of the Research Station is mentioned along with the place where it is located, *e.g.* Agri. Res. Stn., Vyara for Agricultural Research Station, Vyara.

For Central Institutes, the corresponding standard abbreviations have been adopted as given below :

C. A. Z. R. I. — Central Arid Zone Research Institute.
C. P. C. R. I. — Central Plantation Crops Research Institute.
C. P. R. I. — Central Potato Research Institute.
C. R. R. I. — Central Rice Research Institute.
C. S. S. R. I. — Central Soil Salinity Research Institute.
C. T. C. R. I. — Central Tuber Crops Research Institute.
C. T. R. I. — Central Tobacco Research Institute.
C. T R. L. — Cotton Technological Research Laboratory.
I. A. R. I. — Indian Agricultural Research Institute.
I. G. F. R. I. — Indian Grassland & Fodder Research Institute.
I. H. R. — Institute of Horticultural Research.
I. I. S. R. — Indian Institute of Sugarcane Research.
I. L. R. I. — Indian Lac Research Institute.
J. A. R I. — Jute Agricultural Research Institute.
J. T. R. L. — Jute Technological Research Laboratory.
S. B. I. — Sugarcane Breeding Institute.

In case of the experiments conducted on cultivator's fields, whether under an Indian Council of Agricultural Research scheme or by the State Government, the abbreviation (c. f.) is given along with the site or centre as, for example, Cuttack (c. f.).

Type :—Abbreviations used against this item are one, or more than one, of the following : C—Cultural ; D—Control of Diseases and Pests ; I—Irrigational ; M—Manurial ; R—Rotational ; V—Varietal and X—Mixed cropping. In factorial experiments, the treatments will be abbreviated as, for example, Cultural-*cum*-Manurial as CM.

Object :—A statement of the objective of the experiment is given indicating the main crop and the type of the experiment.

Results :—Information under this heading should be read against the following items :

(i) General mean. (ii) S. E. per plot. (iii) Results of test of significance. (iv) Summary table(s), with critical differences for individual effect means which are significant.

**Other abbreviations used in the Experimental Data**

| | | | | | |
|---|---|---|---|---|---|
| Kg | = | Kilogram(s) | Dical. Phos. | = | Dicalcium Phosphate |
| Kg/ha. | = | Kilogram(s) per hectare | Zn. Sul. | = | Zinc Sulphate |
| N | = | Nitrogen | Cu. Sul. | = | Copper Sulphate |
| P | = | Phosphate | Mg. Sul. | = | Magnesium Sulphate |
| K | = | Potash | Mn. Sul. | = | Manganese Sulphate |
| Nitro. Phos. | = | Nitrogen Phosphate | Ammo. Molybdate | = | Ammonium Molybdate |
| Ammo. Phos. | = | Ammonium Phosphate | B. | = | Boron |
| A/S | = | Ammonium Sulphate | Fe. Sul. | = | Ferrous Sulphate |
| A/S/N | = | Ammonium Sulphate Nitrate | F. M. | = | Fish Manure |
| C/A/N | = | Calcium Ammonium Nitrate | G. N. C. | = | Groundnut Cake |
| A/N | = | Ammonium Nitrate | M. C. | = | Municipal Compost |
| A/C | = | Ammonium Chloride | T. C. | = | Town Compost |
| C/N | = | Chilean Nitrate | G. M. | = | Green Manure |
| Mur. Pot. | = | Muriate of Potash | G. L. M. | = | Green Leaf Manure |
| Pot. Sul. | = | Potassium Sulphate | F. Y. M. | = | Farm Yard Manure |
| Super. | = | Super Phosphate | C. M. | = | Cattle Manure |

The information regarding the particulars of research stations may be obtained under the respective items as given below :

## PARTICULARS OF RESEARCH STATIONS

A. *General Information* :

(i) District and the nearest railway station with Latitude, Longitude and Altitude, if available. General topographpy of the experimental area. (ii) Type of tract it represents. (iii) Year of establishment. (iv) Cropping pattern. (v) Programme of research.

B. *Normal Rainfall* :

Average fortnightly rainfall, specifying the period on which the figures are based.

C. *Irrigation and Drainage Facilities* :

(i) (a) Whether available ; if so, since when. (b) Type of facilities available. (ii) Whether there is a proper drainage system.

D. *Soil type and Soil analysis* :

(i) Broad soil type with depth, colour and structure etc. (ii) Chemical analysis. (iii) Mechanical analysis.

E. *No. of Experiments* :

No. of experiments conducted on different crops that have been included in the compendium.

Information under the following heads is to be read against the respective items under experimental data as given on next page.

## BASAL CONDITIONS

*A. For experiments on annual crops :*

(i) (a) Crop rotation followed, if any. (b) Previous crop. (c) Manuring of previous crop (State amount and kind). (ii) Soil type. (iii) Date of sowing/planting. (iv) Cultural practices : (a) Preparatory cultivation. (b) Method of sowing. (c) Seed-rate. (d) Spacing. (e) No. of seedlings per hole. (v) Basal manuring given to the whole experiment with time and method of application. (vi) Variety (indicate also early, medium or late). (vii) Irrigated or un-irrigated. (viii) Important post-sowing/planting cultural operations such as weeding, etc. (ix) Rainfall during crop season. (x) Date of harvest.

*B. For experiments on perennial crops :*

(i) Previous history of the experimental area (Give manuring and other operations). (ii) Soil type. (iii) Method of propagation of plants. (iv) Variety. (v) Date and method of sowing/planting (including spacing). (vi) Age of seedlings at the time of planting. (vii) Basal manuring given to the whole experimental area. (viii) Important cultural operations during the experimental year. (ix) Inter-cropping, if any. (x) Irrigated or un-irrigated (If irrigated, give the source, number, interval and intensity of irrigation). (xi) Rainfall during the experimental year. (xii) Date(s) of harvest.

*C. For experiments on cultivators' fields :*

(i) (a) Crop rotation followed, if any. (b) Previous crop. (c) Manuring of previous crop (State amount and kind). (ii) Soil type and soil analysis, if available. (iii) Basal manuring (Give time and method of application). (iv) Variety. (v) Cultural Practices : (a) Preparatory cultivation. (b) Method of sowing. (c) Seed-rate. (d) Spacing. (e) No. of seedlings per hole. (vi) Date of sowing/planting. (vii) Irrigated or un-irrigated. (viii) Important post-sowing/planting cultural operations such as weeding, etc. (ix) Rainfall during crop season. (x) Date of harvest.

## DESIGN

*A. For experiments on annual crops :*

(i) Abbreviations for designs : C. R. D.—Completely Randomised Design ; R. B. D.—Randomised Block Design ; L. Sq.—Latin Square ; Fact.—Factorial ; Confd.—Confounded ; other designs and modifications of the above to be indicated in full. (indicate confounded effects, if any). (ii) (a) No. of plots per block (in a split-plot experiment, the number of main-plots per replication as well as the number of sub-plots per main-plot should be given). (b) Block dimensions. (iii) No. of replications. (iv) (a) Gross plot-size. (b) Net plot-size. (v) Border or guard rows kept. (vi) Whether treatments are randomised (independently in each block).

*B. For experiments on perennial crops :*

(i) Abbreviations for designs: C. R. D.—Completely Randomised Design ; R. B. D.—Randomised Block Design ; L. Sq.—Latin Square ; Fact.—Factorial ; Confd.—Confounded ; other designs and modifications of the above to be indicated in full. (indicate confounded effects, if any) (ii) (a) No. of plots per block (in split-plot experiments, the number of main-plots per replication as well as the number of sub-plots per main-plot should be given). (b) Block dimensions. (iii) No. of replications. (iv) (a) Net plot-size. (b) No. of trees per plot (In case of experiments on grasses give plot-size). (v) Border or guard rows kept. (vi) Whether treatments are randomised (independently in each block).

*C. For experiments on cultivator's fields :*

(i) Design with No. of plots/block and No. of replications (In split-plot experiments, the number of main-plots per replication as well as the number of sub-plots per main-plot should be given). (ii) Method of selection of sites with number and distribution of experiments. (iii) (a) Gross plot-size. (b) Net plot-size. (iv) Whether treatments are randomised (independently in each block).

# GENERAL INFORMATION

*A. For experiments on annual crops* :

(i) General crop condition during growth (if lodged, state date of lodging). (ii) Incidence of pests and diseases and control measures taken, if any. (iii) Types of quantitative observations taken. (iv) (a) If the experiment has continued for more than one year, indicate year of commencement and year of termination. (b) Whether treatments assigned to the same plots every year. (c) Reference to combined analysis, if any. (v) Other centres, if any, where the same experiment has been conducted with reference numbers. (vi) Abnormal occurances such as heavy rains, frost, storm, drought, etc. (vii) Any other important information.

*B. For experiments on perennial crops* :

(i) General crop condition during growth. (ii) Incidence of pests and diseases and control measures taken, if any. (iii) Types of quantitative observations taken. (iv) If the experiment has continued for more than one year, indicate year of commencement and year of termination (Give reference of previous years, if any). (v) Other centres, if any, where the same experiment has been conducted with reference numbers. (vi) Reference to combined analysis, if any. (vii) Abnormal occurances such as heavy rains, frost, storm, drought, etc. (viii) Any other important information.

*C. For experiments on cultivator's fields* :

(i) General crop condition during growth. (ii) Incidence of pests and diseases and control measures taken, if any. (iii) Types of quantitative observations taken. (iv) In case of repetition in successive years. (a) Year of commencement and termination. (b) Whether treatments assigned to the same plots every year. (c) Reference to combined analysis, if any. (v) In case of repetition at other places, give names with references, if any. (vi) Abnormal occurances such as heavy rains, drought, etc. (viii) Any other important information.

* * *

## GLOSSARY OF VERNACULAR NAMES OF CROPS

| Sl. No. | Name of Crop | Botanical Name | Assamese | Bengali | Oriya | Telugu | Tamil | Malayalam | Kannada | Marathi | Gujarati | Hindi | Punjabi |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Paddy | *Oryza sativa* L. | Dhan | Dhan | Dhano | Vadlu, Biyyamu | Nel | Nellu | Bhatta | Bhat | Dangar | Dhan, Chawal | Chaul, Dhan |
| 2 | Wheat | *Triticum sativam* Lamk,<br>*Triticum aestivum* L. | Gaum ; Ghehu | Gam | Gaham | Godumalu | Kothumai | Gothambu | Godhi | Gahu | Ghahu | Gehon | Kanak |
| 3 | Jowar | *Andropogon sorghum* | — | Jowar | Juara | Jonna | Cholam | Cholam | Jola | Jowari<br>Jondhla | Jowari<br>Juar | Jowar ; Jaur | Jowar |
| 4 | Maize | *Zea mays* L. | Gom dhan | Bhutta | Macca | Makka-Jonna | Makka-cholam | Cholam<br>Makka-holam | Musukina Jola | Makka | Makkai | Makka | Makki, Makayee |
| 5 | Bajra | *Pennisetum typhoides* | — | Bajra | Bajra | Sajja | Kambu | Kambu | Sajje | Bajri | Bajri | Bajra | Bajra |
| 6 | Ragi | *Fleusine coracana Gaertn* | — | Marwa | Mandia | Ragi ; Chodi | Keppai ; Ragi | Muthari ; Ragi | Ragi | Nagli ; Nachni | Nagli ; Bauto | Ragi ; Mandika ; Marwah | Mandhuka ; Mandhal |
| 7 | Tenai | *Setaria italica Beauv* | — | Kaon | Kanghu ; Kangam ; Kora | Korra | Tenai | Thena | Navane | Kang ; Rala | Kang | Kakum | Kangni |
| 8 | Tur | *Cajanus cajan* Milsp. ;<br>*Cajanus indicus* sprengl. | Arhar | Arahar | Harad | Kandulu | Thuvarai | Thuvaran payaru | Thogari | Tur | Tuver | Arhar | Harhar, Arhar |
| 9 | Gram | *Cicer arietinum* L. | Butmah | Chola | Boot | Senagalu | Kadalai, Sundal Kadalai | Kadala | Kadale | Harbara | Chana | Chana | Chhole ; Chana |
| 10 | Green Gram (Mung) | *Phaseolus aureus* Roxb | Magumah | Sonamug | Mung | Pachapesalu | Pachaipayru<br>Pasipayaru | Cerupayaru<br>Payaru | Hesaru | Mug | Mag | Moong | Moong ; Mug |
| 11 | Sugarcane | *Saccharum officinarum* L. | Kuhiar | Akh | — | Cheruku | Karumbu | Karimbu | Kabbu | Oos | Sherdi | Ganna ; Kamad ; Naishakar | Kamad ; Ganna ; Eakh |
| 12 | Cotton | *Gossypium spp.* | Kapah | Karpas ; Tula | Kapa | Pratti | Paruthi | Paruthi | Hatti | Kapus | Kapas | Kapas | Kapah |
| 13 | Tobacco | *Nicotiana tabacum* L. | Dhopat | Tamak | Uanpatra | Pogaku | Pugayilai | Pukayila | Hoge Sappu | Tambaku | Tamaku | Tambaku | Tamaku<br>Tambaku |

## GLOSSARY OF VERNACULAR NAMES OF CROPS Contd.

| Sl. No. | Name of Crop | Botanical Name | Assamese | Bengali | Oriya | Telugu | Tamil | Malayalam | Kannada | Marathi | Gujarati | Hindi | Punjabi |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | Groundnut | *Arachis hypogaea* L. | China badam | Cheena badam | China-badam | Nelashanga | Nilakadalai | Nilak-kadala | Kadale kayi | Bhuimug | Bhoising ; Magafali | Mungphali | Mungfali |
| 15 | Caster | *Ricinus communis* L. | Eri | Rehri | Jada | Amudalu | Amanakku | Avanakku | Haralu | Erandi | Diveli<br>Erando | Rehri | Arind ; Harind ; Rind |
| 16 | Chillies | *Capsicum frutescens* L. | Jalakya | Lanka; Marich | Lanka | Mirapakaya | Milakai | Mulaku | Menasina kayi | Mirchi | Marcha | Lalmirich | Lalmirch |
| 17 | Cardmum | *Elettaria cardamomum* Maton | Elachi | Chota elach | Gujurati | Yelak-kayalu | Ealakai | Elam | Yalakki | Veldode | Elaichi<br>Elchi | Elachi | Illaichi |
| 18 | Pepper | *Piper nigrum* L. | Jaluk | Golmiarch | Galmirach | Miriyalu | Milagu | Kuru Mulaku | Kare menasu | Miri | Mari | Kalimirich | Kalimirich |
| 19 | Paragrass | *Brachiaria munica* ;<br>*Penicum purpurascens* Raddi | Para ghah | Nardul | Ghara ghasa | Enumugaddi | Neerpul | — | Mauritius hullu | Para gavat | Para ghas | Para ghas | Para ghah |
| 20 | Citrus | *Citrus sinensis* Osbeck | Malta ; Mozambique | Mosambi | Mitha kamala | Battayi | Sathugudi; Cheeni | Madura naranga | Sathkudi | Mosambi | Mosambi | Malta<br>Mausmee | Malta |
| 21 | Coffee | *Coffea aralica* L. | Coffee | Kafi | Kofi | Coffee | Kappi | Coffee | Kafi | Kafi | Kafi | Coffee | Kofi |
| 22 | Arecanut | *Arecca Catechu* L. | Tamol | Supari | Gua | Poka | Kamuhu ; Pakku | Kavungu | Adike | Supari | Supari | Supari | Supar |
| 23 | Coconut | *Cocos nucyera* L. | Narikol | Narikol | Madia | Kabbera | Thennai | Thengu | Thengina kayi | Naral | Nalieri | Narial | Naryal,<br>Narel |
| 24 | Cashewnut | *Aracardium occidentab* | Kaju | Kaju badam | Lanka amba | Jeedima midi | Mundiri | Kasu mavc | Godambi | Kaju | Kaju | Kaju | Khaja |

# CONTENTS

Page

FOREWORD ... (iii)

PREFACE ... (v)

LIST OF ABBREVIATIONS ... (ix)

GLOSSARY OF VERNACULAR NAMES OF CROPS ... (xiii)

MYSORE STATE (Salient features of experimentation) ... (xvii)

PARTICULARS OF RESEARCH STATIONS AND SOIL ANALYSIS ... (xxii)

**EXPERIMENTAL DATA**

Paddy ... 1

Wheat ... 134

Jowar ... 159

Bajra ... 238

Maize ... 245

Ragi ... 257

Korra ... 280

Gram ... 283

Green Gram ... 287

Tur ... 287

Potato ... 288

Sugarcane ... 292

Cotton ... 361

Tobacco ... 459

Groundnut ... 477

Caster ... 518

Grass ... 520

Cardmum ... 529

Pepper ... 532

Chillies ... 534

Citrus ... 536

Coffee ... 551

Cashewnut ... 597

Arecanut ... 600

Coconut ... 609

Mixed cropping experiments ... 609

Rotational type ... 6I7

Index (crop-wise and type-wise) ... 625

# MYSORE

*(Salient features of experimentation)*

The general information regarding the agro-climatic regions, extent of irrigation, normal cropping pattern, etc. of the State of Mysore has been furnished in the first and the second series of the National Index of Agricultural Field Experiments already published for the periods 1948-53 and 1954-59 respectively.

This volume includes the results of 1149 experiments conducted during the period 1960-65, besides experiments belonging to all India Co-ordinated Agronomic Experiments Scheme of I.C.A.R., as against 1293 experiments for the period 1954-59 and 565 for the period 1948-53. The consolidated results of the experiments conducted for more than one year and concluded during the period 1960-65 numbering 676 and forming 249 groups, have been presented with crop-wise and type-wise distribution in Table 1 below :

TABLE-I

Number of groups of experiments conducted during the period 1960-65.

(Crop-wise and type-wise)

| Type<br>Crop | M | MV | C | CV | CM | CMV | I | IM | IC | D | X | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Paddy | 28(91) | 2(5) | 17(39) | 9(22) | 6(19) | — | 1(3) | — | — | 3(7) | — | 66(186) |
| Jowar | 25(71) | — | 3(13) | 2(7) | 3(6) | — | — | — | — | — | — | 33(97) |
| Wheat | 12(31) | — | 2(4) | — | 2(6) | — | — | — | — | — | — | 16(41) |
| Bajra | — | — | 1(3) | — | — | — | — | — | — | 1(3) | — | 2(6) |
| Maize | — | 1(2) | — | — | — | — | — | 2(5) | — |  | — | 3(7) |
| Ragi | 5(10) | — | 4(8) | — | — | 1(2) | — | — | — | — | — | 10(20) |
| Korra | 2(4) | — | — | — | — | — | — | — | — | — | — | 2(4) |
| Sugarcane | 14(36) | — | 4(10) | — | 6(14) | — | 1(2) | 2(4) | — | 1(2) | — | 28(68) |
| Cotton | 18(47) | — | 4(8) | — | 5(12) | — | — | — | 1(2) | 4(12) | — | 32(81) |
| Tobacco | 3(7) | — | 2(5) | — | — | — | — | — | — | 3(8) | — | 8(20) |
| Groundnut | 10(25) | — | 4(9) | 1(5) | — | — | — | — | — | 2(4) | — | 17(43) |
| Castor | 1(3) | — | — | — | — | — | — | — | — | — | — | 1(3) |
| Grass | 1(3) | — | 2(6) | — | — | — | — | — | — | — | — | 3(9) |
| Citrus | 1(3) | — | 1(4) | — | — | — | — | — | — | — | — | 2(7) |
| Coffee | 9(32) | — | 4(9) | — | 2(6) | — | — | — | — | 3(11) | — | 18(58) |
| Arecanut | 3(10) | — | — | — | — | — | — | — | — | 3(10) | — | 6(20) |
| Mixed cropping | — | — | — | — | — | — | — | — | — | — | 2(6) | 2(6) |
| Total | 132(373) | 3(7) | 48(118) | 12(34) | 24(63) | 1(2) | 2(5) | 4(9) | 1(2) | 20(57) | 2(6) | 249(676) |

N.B. Figures in the bracket indicate total number of experiments in the crop.

The results of the experiments conducted for only one year during the period under report and also those of the experiments which are continued beyond 1965, numbering 460 have been presented. The distribution of all experiments, according to crop and type of treatments is furnished in Table 2 below :

### TABLE 2

Number of groups experiments conducted during the period 1960-65
(Crop-wise and Type-wise)

| Type / Crop | M | MV | C | CV | CM | CMV | I | IM | IC | ICV | D | X | R | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Paddy | 122 | 8 | 40 | 25 | 21 | 2 | 4 | — | — | — | 15 | — | — | 237 |
| Wheat | 41 | — | 5 | 1 | 6 | — | — | 4 | — | — | — | — | — | 57 |
| Jowar | 95 | 2 | 23 | 7 | 9 | 1 | — | 1 | — | 4 | 7 | — | — | 149 |
| Bajra | — | — | 3 | — | — | 2 | — | — | — | — | 3 | — | — | 8 |
| Maize | — | 4 | — | 1 | — | 2 | — | 8 | — | — | — | — | — | 75 |
| Ragi | 18 | — | 10 | — | — | 2 | — | — | — | — | 1 | — | — | 31 |
| Korra | 6 | — | — | — | — | — | — | — | — | — | — | — | — | 6 |
| Gram | — | — | — | 1 | — | — | — | 3 | — | — | — | — | — | 4 |
| G. Gram | — | — | 1 | — | — | — | — | — | — | — | — | — | — | 1 |
| Tur | — | — | — | — | — | — | — | — | — | — | 2 | — | — | 2 |
| Sugarcane | 59 | 1 | 14 | 1 | 17 | — | 4 | 10 | — | — | 10 | — | — | 116 |
| Cotton | 70 | — | 16 | 3 | 21 | — | 3 | 2 | 4 | — | 36 | — | — | 155 |
| Tobacco | 16 | — | 7 | — | — | — | — | — | — | — | 8 | — | — | 31 |
| G. Nut | 30 | — | 18 | 5 | — | — | 1 | — | — | — | 5 | — | — | 59 |
| Castor | 3 | — | — | — | — | — | — | — | — | — | — | — | — | 3 |
| Grass | 5 | 1 | 6 | 4 | — | — | — | — | — | — | — | — | — | 16 |
| Cardamom | — | — | 5 | — | — | — | — | — | — | — | 7 | — | — | 12 |
| Pepper | — | — | 1 | — | — | — | — | — | — | — | — | — | — | 1 |
| Chillies | 1 | 1 | — | — | — | — | — | — | — | — | — | — | — | 2 |
| Citrus | 3 | — | 31 | — | — | — | — | 4 | 4 | — | 6 | — | — | 48 |
| Coffee | 78 | — | 14 | — | 16 | — | — | 2 | — | — | 20 | — | — | 130 |
| Cashewnut | — | — | 9 | — | — | — | — | 4 | — | — | — | — | — | 13 |
| Arecanut | 11 | — | 11 | — | — | — | — | — | — | — | — | — | — | 22 |
| Coconut | — | — | — | — | 2 | — | — | — | — | — | — | — | — | 2 |
| X | — | — | — | — | — | — | — | — | — | — | — | 20 | — | 20 |
| R | — | — | — | — | — | — | — | — | — | — | — | — | 9 | 9 |
| Total | 558 | 17 | 214 | 48 | 92 | 9 | 12 | 38 | 8 | 4 | 120 | 20 | 9 | 1149 |

Out of the total number of experiments reported for the period 1960-65, about 21 per cent were conducted on Paddy crop, about 14 per cent each on Cotton and Jowar and about 11 per cent on each of the two crops Sugarcane and Coffee. The remaining experiments were spread over a variety of crops, important of these being Wheat, Ragi, Groundnut, Tobacco and Citrus.

Manurial experiments accounted for about 49 per cent of the total number of experiments, while those relating to cultural practices and control of 'Diseases and Pests' accounted for about 19 per cent and 10 per cent respectively. Experiments with irrigational treatments and those with varietal treatments constituted each about 7 per cent of the total number of experiments conducted.

The principal crops of the state are Paddy, Jowar, Maize, Ragi, Cotton and Groundnut. Bajra and pulses also cover large areas. Cash crops like Sugarcane, Tobacco, Chillies and plantation crops like Coffee, Cashewnut, Coconut and Arecanut are also grown in some parts of the state, but they occupy relatively small areas. The salient feature of experimentation on important crops are given below :

*Paddy* :—Paddy covered 1059* thousand hectares i.e. about 10 per cent of the total cropped area. Out of the 237 experiments, 186 experiments forming 66 groups were concluded during the period under report. Experiments were conducted under irrigated as well as rainfed conditions. Varieties like G. E. B. 24, S. R. 26 B, S- 661, S-1092 and Co-14 were mostly used for experiments conducted under irrigated condition, while A-200 (late) M. G. L.-5, P.T.B. 9, P. T. B.-10, K. B.-356, M-141, M-14, Co-14 and Co-25 were the varieties grown on which experiments were conducted under rainfed conditions. The net plot size adopted for experiments varied from 11·6 sq. meters to 85·6 sq. metres.

Randomised Block Design was commonly adopted for experimentation. Out of 237 experiments, in as many as 158 experiments, this design was used. Split-plot, Confounded and Latin Square designs were adopted in 44, 24 ond 9 experiments respectively. In respect of 2 experiments Strip-plot Design was adopted. The experiments laid out in different designs had replications ranging from 2 to 6 for Randomised block as well as Split-plot designs and 1 or 2 for Confounded design.

About 65 per cent of the total number of experiments, were of manurial type or had manure as one of the factors. The levels of N, P and K tried on these experiments ranged between 0 and 100·8 Kg/ha., 0 and 74·1 Kg/ha. and 0 and 67·2 Kg/ha. respectively. Besides these, results of experiments with different cultural practices like, methods of planting, plant and row spacings, seed rates, irrigational practices and of those on conrol the pests and diseases have been included in the present volume.

*Jowar* :-Jowar covered 2843* thousand hectares i. e. 26·3 per cent of the total cropped area. Out of 149 experiments, 97 experiments forming 33 groups were concluded during the period under report. About 72 per cent of the experiments were conducted under rainfed condition. Varieties like M-35-1, Nandyal, Fulgar white, EM-4-1-4 and D-340 were tried on experiments under rainfed condition. Co-9, M-312 and D-40 were the varieties commonly used in experiments conducted under irrigated condition. The net-plot area varied from 20 3 sq. meters to 23·3 sq. meters.

Randomised Block Design was generally adopted for experimentation. About 117 experiments were laid out in this design. Split-plot Confounded and Latin-square designs were adopted in the case of 13, 11 and 8 experiments respectively. 2 to 12 replications were used in the case of experiments laid out in Randomised Block Design while 2 to 6 and 1 or 2 replications were used in the cases of Split-plot and Confounded designs respectively.

Manurial experiments accounted for 64 per cent of the total number of experiments. In these experiments levels of N, P and K tried varied between 0 to 89·6 Kg/ha., 0 to 112.8 Kg/ha. and 0 to 67·2 Kg/ha. respectively. Beside these, result of experiments with different cultural practices like methods of sowing, plant and row spacing etc., irrigational practices and of those on control of disease and pests have been included in this volume.

*Ragi* :—Ragi covered 931* thousand hectares accounting for 9·2 per cent of the total cropped area. Out of 31 experiments, 20 experiments forming 10 groups, were concluded during the period under report. Most of the experiments were conducted under rainfed conditions. M 22 and Poorna varieties were commonly used. The net-plot size varied from 20·4 to 179·6 square meters. 21 experiments were conducted in Randomised Block Design and the remaining 10 experiments were distributed equally between Split-plot and Confounded designs. 3 to 6 replications were normally used in experiments laid out in Randomised Block Design, except in one experiment where as many as 12 replications were adopted. In Split-plot and Confounded designs 2 to 6 and only 2 replications were used respectively. About 6 per cent of the total number of experiments conducted on this crop were of manurial type. The levels of N tried varied from 0 to 89·6 Kg/ha. while that of P and K ranged between 0 to 44·8 Kg/ha.

*Cotton* :– Cotton covered 980* thousand hectare accounted for 9·1 percent of the total cropped area. Out of 155 experiments, 81 experiments forming 32 groups were concluded during the period under report. As many as 119 experiments were conducted under rainfed conditions. M.A-5, Jayadhar Western, and Suyodhar where the varieties mostly used in experiments conducted under rain-fed conditions, while Laxmi variety was commonly used in experiments under irrigated and rainfed conditions. The net-plot size varied from 7·29 to 201·3 square meters. In 93 experiments Randomised Block Design was adopted. Split-plot, Confounded and Latin square designs were used in 29, 20 and 4 experiments respectively. The experiments laid out in different designs had replications ranging between 3 and 8, 2 and 4 and 1 and 4 for Randomised Block, Split-plot and Confounded designs respectively. About 60 per cent of the experiments were of manurial type or had manure as one of the factors applied. The levels of N, P and K tried in these experiments varied between 0 and 112·1 Kg/ha. In cultural experiments seed rate, spacing between rows and plants etc. were the important practices tested.

*Sugarcane* :—Sugarcane covered 79* thousand hectares accounting for about 0·73 per cent of the total cropped area. 68 experiments forming 28 groups were concluded during the period under report. All the 116 experiments on this crop were conducted under irrigated conditions. Co—419 was the variety used. The net-plot size varied between 19·17 and 100·10 Sq. meters. 92, 17 and 8 experiments were conducted in Randomised Block, Split-plot and Confounded designs respectively. The experiments laid out in different designs had replications ranging between 2 and 6, 2 and 4 and 1 and 2 for Randomised Block, Split-plot and Confounded designs respectively. About 75 per cent of the experiments were of manurial type or had manure as one of the factors applied. The levels of N, P and K tried in these experiments varied between 0 to 336·2, 0 to 168·1 and 0 to 252·0 Kg/ha. In cultural experiments dates of sowing, seed rates, and spacings were some of the important treatments tried. Results of the experiments with irrigational practices and those on control of Pests and Diseases have been included in this volume.

*Groundnut* :—Groundnut covered 871* thousand hectares i.e. 8·2 per cent of the total cropped area. 43 experiments out of 59 experiments forming 17 groups were concluded during the period under report. As many as 36 experiments were conducted under rainfed conditions Spanish improved and M.G.—10 were the varieties used in experiments conducted under rainfed conditions, while T.M.V.—2 variety was tried in experiments under irrigated conditions. The net-plot size varied from 9·48 to183· 96 sq. meters. 37, 12 and 8 experiments were conducted in Randomised Block. Latin square and Split-plot designs and the remaining 2 on Confounded Design. About 54 per cent of the total number of experiments were of purely manurial type. Levels of N, P and K tried in those experiments varied between 0 to 130·2, 0 to 390·6 and 0 to 224·3 Kg/ha. respectively. In cultural experiments inter-row and plant spacings and dates of sowing were the important factors tried.

*Coffee* :—Coffee is an important plantation crop grown in the state on which 130 experiments were reported. 58 experiments forming 18 groups were concluded during the period under report. About 3/4th of the experiments were conducted under rainfed conditions. 85 and 40 experiments were conducted under Randomised Block and Latin Square Designs while split-plot design was adopted for 5 experiments. About 62 per cent of the total number of experiments were of manurial type. The levels of N, P and K tried in these experiments varied between 0 to 139·4, 0 to 50·4 and 0 to 67·2 Kg/ha. In cultural experiments, digging, spacings, mulching and prunnings were the factors tried.

*Arecanut* :—Out of 22 experiments reported for this crop, 11 were of manurial type and the remaining 11 of cultural type. 12, 7 and 3 experiments were conducted under Randomised Block, Split-plot and confounded designs respectively. In manurial experiments levels of N, P and K varied from 0 to 67·2, 0 to 89·7 and 0 to 112·1 Kg/ha. Spacings and intercropping with Green manure crops were the factors tried in cultural experiments.

*Cashewnut* :—9 out of 13 experiments reported on this crop were of cultural type. Only Randomised Block Design was adopted in all the experiments. Training the plants and methods of propagation were the factors tried in experiments.

*Coconut* :—2 cultural-cum-manurial type of experiments were reported on this crop. Rondomised Block Design with 3 replications was adopted in the experiments.

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*Figures taken from Indian Agricultural Statistics, Vol. I issued by the Directorate of Economics and Statistics, Ministry of Food and Agriculture, C.D. and Co-operation for 1964-65.

## 1. Agricultural Research Station, Alnavar.

*A. General Information* :

(i) In Dharwar taluka of Dharwar district, with Lat.-17°N/Long.-75° E./Alt.-564 m. Small paddy terraces of varying slopes. (ii) It represents Malnad tract. (iii) Established in 1948. (iv) Paddy-Sugarcane is the normal cropping pattern. (v) To study the possibilities of improving the yield of sugarcane crop in the malnad tract where the crop is taken as a rainfed crop with one or two irrigations.

*B. Normal Rainfall* :

| Jan. | Feb. | March | April | May | June | |
|---|---|---|---|---|---|---|
| 0·1 | 0·1 | 0·3 | 4·0 | 11·8 | 19·7 | |
| **July** | **Aug.** | **Sept.** | **Oct.** | **Nov.** | **Dec.** | **Total** |
| 47·9 | 20·5 | 9·5 | 18·1 | 2·3 | 0·6 | 134·9 |

(Av. monthly rainfall in cm., based on the data for the last 14 years).

*C. Irrigation and Drainage Facilities* :

(i) (a) Irrigation facilities are available since 1948. (b) By well and a small tank. (ii) Proper drainage system exists.

*D. Soil type and Soil analysis* :

(i) Red to medium black soil to a depth of 12·5 to 15 cm. and structure coarse to medium. (ii) Chemical analysis : pH. 6·76 ; Calcium carbonate ($CaCO_3$)—2·0% ; Organic carbon-1·13% ; Total N-0·114% ; available $P_2O_5$-4·91 mgms./100 gm. ; Total soluble salts-0·042%. (iii) Mechanical analysis : N.A.

*E. No. of Experiments* :

Sugarcane—4 ; Total=4.

## 2. Agricultural Research Station, Arbhavi.

*A. General Information* :

(i) In Gokak taluka of Belgaum district, with Lat.-16° N/Long-74·5° E./Alt.-585 m. The topography of the experimental area is flat and even. (ii) Penunisular India, northern parts of Mysore, Ghataprabha left bank canal. (iii) Established in January, 1959. (iv) Experiments on Maize crop in *Kharif* followed by a general crop in *Rabi*. (v) Agronomical study on Maize is the main programme of research.

*B. Normal Rainfall* :

| Jan. | Feb. | March | April | May | June | |
|---|---|---|---|---|---|---|
| — | 0·3 | 1·0 | 1·3 | 8·9 | 3·6 | |
| **July** | **Aug.** | **Sept.** | **Oct.** | **Nov.** | **Dec.** | **Total** |
| 11·3 | 5·8 | 9·8 | 8·3 | 3·6 | 1·8 | 55·7 |

(Av. monthly rainfall in cm., based on the data for the period 1957-65).

*C. Irrigation and Drainage Facilities* :

(i) (a) and (b) Irrigation facilities are available from the starting of the scheme. (ii) Open drainage system.

*D. Soil type and Soil analysis* :

(i) Broad soil types—Black sandy loam; Depth—60 cm.; Colour—Medium black; Structure—Sandy loam. (ii) Chemical analysis : Nitrogen—0·056% ; Phosphorus—0·173% ; Potash—0·38% ; pH.—8·4.

(iii) Mechanical analysis :

| Depth | 2·5—30 cm. | 30—60 cm. |
|---|---|---|
| Clay% | 38·36 | 30·36 |
| Silt% | 8·80 | 7·80 |
| Coarse Sand% | 30·64 | 45·64 |
| Fine Sand% | 13·86 | 10·36 |

*E. No. of Experiments* :

Wheat—4, Jowar—5, Maize—12, Gram—3, Sugarcane—10, Cotton—4 ; Total=38.

### 3. Coconut Research Station, Arsikere.

*A. General Information* :

(i) In Hassan district, nearest Rly. Stn., Arsikere with Lat.-13° 18′ N./Long.-76° 15′ E./ Alt.-808 m The general topography of the experimental area is levelled to general slope with gradiation of 1·52 to 3·08 m. (ii) It represents rainfed tract. (iii) Established in 1953. (iv) Perrennial crops. (v) Concentrated on Coconut crop.

*B. Normal Rainfall* :

| Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0·2 | 0·2 | 0·2 | 3·9 | 10·4 | 2·7 | 5·9 | 6·2 | 12·1 | 15·9 | 3·4 | 3·4 | 64·5 |

(Av. monthly rainfall in cm., based on the data for the period 1962-71).

*C. Irrigation and Drainage Facilities*

(i) (a) and (b) One well, irrigation since 1950. Another well from 1969. (ii) Yes, natural drainage.

*D. Soil type and Soil analysis* :

(i) Red as well as medium black. (ii) Chemical analysis and (iii) Mechanical analysis : N.A.

*E. No. of Experiments* :

Coconut—2 ; Total=2.

### 4. Agricultural Research Station, Bagalkot.

*A. General Information* :

(i) In Bagalkot taluka of Bijapur district, with Lat.-16° N/Long.-76° E./Alt.-538 m. The topography of the experimental area is good. (ii) Eastern dry tract. (iii) Established in 1951. (iv) *Suyodhar* Cotton, Groundnut, Sataria. (v) Agronomical and weedicidal experiments on *Suyodhar* Cotton, Groundnut, *Jowar* and Setaria.

B. *Normal Rainfall* :

| Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| — | 0·4 | 0·4 | 1·1 | 3·9 | 9·3 | 7·8 | 18·4 | 11·1 | 13·9 | 0·4 | 9·5 | 76·2 |

(Av. monthly rainfall in cm., based on the data for the period 1963-65).

C. *Irrigation and Drainage Facilities* :

(i) (a) and (b) Dry tract. (ii) Nil.

D. *Soil type and Soil analysis* :

(i) Broad soil types : Depth—Surface 30 cm. ; Colour—Black soil ; Structure—Black soil. (ii) Chemical analysis : pH.—9·3 ; total soluble salt—0·41% ; Organic Carbon—0·31% ; available $P_2O_5$—1·8 Kg/ha. ; available $K_2O$—47 Kg/ha. (iii) Mechanical analysis : N.A.

E. *No. of experiments* :

Jowar—11, Bajra—1, Cotton—7, Mixed cropping—2, Rotational—1 ; Total=22.

### 5. Regional Sorghum Research Station, Bailhongal.

A. *General Information* :

(i) In Bailhongal taluka of Belgaum district, with Lat.-16·0° N/Long.-75·5° E./Alt.-680 m. above m.s.l. The farm is situated on an elevated area, has got general slope towards eastern sides. (There is a Nala running on the northern side of the farm area). (ii) Transition tract. (iii) Established in 1947-48. (iv) First year : *Kharif* Jowar ; 2nd year : Groundnut in *Kharif* and Wheat or Gram in *Rabi* season. (v) Agronomical and varietal experiments on Groundnut and *Jowar* etc.

B. *Normal Rainfall* :

| Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| — | 0·2 | 0·6 | 3·4 | 9·1 | 8·8 | 16·0 | 10·0 | 10·4 | 14·3 | 3·1 | 0·4 | 76·3 |

(Av. monthly rainfall in cm., based on the data for the period 1964–65).

C. *Irrigation and Drainage Facilities* :

(i) and (ii) Nil.

D. *Soil type and Soil analysis* :

(i) Broad soil types : Medium black soil varying from 45 to 115 cm. depth ; Light red mixture—15 to 23 cm. ; Colour—Medium black and light red mixture. (ii) Chemical analysis and (iii) Mechanical analysis : Information—N.A.

E. *No. of Experiments* :

Groundnut—1 ; Total=1.

### 6 Agricultural Research Station, Bailhongal.

A. *General Information* :

(i) to (iii) Same as for Regional Sorghum Research Station, Bailhongal. (iv) (a) Double cropping. (b) Mixed and overlapping cropping. (v) Mainly Agronomic trials are laid out. In the plant breeding type of research this acts as a testing centre to Regional Research Station, Dharwar.

B. *Normal Rainfall* :

Same as for Regional Sorghum Research Station, Bailhongal.

C. *Irrigation and Drainage Facilities* :

(i) (a) and (b) No irrigation facilities are available. (ii) Yes, there is a proper drainage system.

D. *Soil type and Soil analysis* :

(i) Broad soil type and (ii) Chemical analysis as below :

| Sl. No. | Name of the block | Soil type | pH. | E.C. | O.C.% | $P_2O_5$ Kg/ha. | $K_2O$ Kg/ha. |
|---|---|---|---|---|---|---|---|
| 1. | A | — | — | — | — | — | — |
| 2. | B | Medium to deep black | 7·8 | 0·52 | 0·73 | 96 | 706 |
| 3. | C | Medium black mixed with lime nodules | 7·8 | 0·34 | 0·74 | 85 | 717 |
| 4. | D | Deep black | 7·7 | 0·42 | 0·68 | 67 | 583 |
| 5. | E | Medium to deep black | 7·6 | 0·40 | 0·84 | 98 | 572 |
| 6. | F | Medium black mixed with lime nodules | 7·9 | 0·36 | 0·63 | 103 | 605 |
| 7. | G | Medium to light | 7·7 | 0·30 | 0·69 | 90 | 594 |
| 8. | H | Light losse | 7·3 | 0·55 | 0·81 | 112 | 785 |
| 9. | I | Light shallow | 6·7 | 0·65 | 0·71 | 47 | 672 |
| 10. | J | Light losse to compact | 6·9 | 0·55 | 0·73 | 35 | 773 |
| 11. | K | Medium black to light | 7·5 | 0·40 | 0·90 | 83 | 717 |
| 12. | L | Karl to light | 6·7 | 0·62 | 0·61 | 24 | 94 |
| 13. | M | Light losse to compact | 7·7 | 0·50 | 0·63 | 26 | 762 |
| 14. | N | Light compact | 6·4 | 0·85 | 0·62 | 54 | 740 |

(iii) Mechanical analysis : N.A.

E. *No. of Experiments* :

Wheat—10 ; Jowar—10, Groundnut—3, Mixed cropping—1 ; Total=24.

## 7. Central Coffee Research Institute, Balehnnur.

A. *General Information* :

(i) In Koppa taluka of Chikmagalur district, 101 km. from Kadur Rly. Stn., on Bangalore Poona Line with Lat.-13° 22′ N/Long.-75° 28′ E./Alt.-830 to 915 m. above m.s.l. The topography of the experimental area is hilly and undulating with rolling to gently slopping lands capes. (ii) Malnad tract. (iii) Established in 1925. (iv) Coffee as perennial crop. (v) Soil chemistry, Agricultural chemistry, Agronomical, Botanical, Plant Pathological, Physiological experiments on Coffee.

B. *Normal Rainfall* :

| Jan. | | Feb. | | March | | April | | May | | June | | July | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| — | — | — | 0·5 | 0·4 | 1·1 | 5·3 | 9·4 | 3·6 | 12·4 | 10·9 | 18·1 | 55·5 | 40·7 |

| Aug. | | Sept | | Oct. | | Nov. | | Dec. | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | |
| 52·5 | 33·5 | 9·1 | 10·2 | 19·0 | 13·8 | 4·7 | 0·9 | 1·7 | 0·2 | 303·5 |

(Av. fortnightly rainfall in cm., based on the data for the period 1960-64).

*C. Irrigation and Drainage Facilities* :

(i) (a) Yes, irrigation facilities are available since 1961-62. (b) N.A. (ii) Yes, proper drainage system exists.

*D. Soil type and Soil analysis* :

(i) Broad soil types : Order-orisols ; Depth-Deep to very deep. Colour—Redish brown to dark red ; Structure—Moderately granular. (ii) Chemical analysis : Nitrgen-0·2 to 0·3% : Org. Carbon-about 3% ; Cation exch. Cap.-6 to 10 m. e./100gm. (soil); Sesquiorides-20 to 30% ; Total $P_2O_5$ 0·04 to 0·10% ; Total $K_2O$ 0·3 to 0.6%; Total MgO-0·1 to 0·2% ; Total CaO 0.1 to 0·3%. (iii) Mechanical analysis : Silty clay loam.

*E. No. of Experiments* :

Coffee-106; Total=106

## 8. Soil Conservation Research, Demonstration & Training centre, Bellary

*A. General Information* :

(i) In Bellary taluka of Bellary district, main Office 4.8 Km., farm 10 Km. from Bellary Jn. with Lat.-15·09° N/Long-76·51° E./Alt-445 M. above m.s.l. The topography of the experimental area is plain, deep black soils upto 2% slope. (ii) Arid and semi-arid deep black soils. (iii) Established in 1954. (iv) Rainfed and irrigated Cotton, Jowar, Safflower, Bengal gram etc. in *Rabi* season. (v) Soil and water management in all aspects.

*B. Normal Rainfall* :

| Jan. | | Feb. | | March | | April | | May | | June | | July | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| — | — | — | — | 0.2 | 2.5 | 16.3 | 19.0 | 22.1 | 33.6 | 17.7 | 26.3 | 13.2 | 20.7 |

| Aug. | | Sept. | | Oct. | | Nov. | | Dec. | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | |
| 17.9 | 21.1 | 31.4 | 59.9 | 42.3 | 63.8 | 27.3 | 2.3 | 44.4 | 22.3 | 504.3 |

(Av. fortnightly rainfall in cm., based on the data for the period 1960-64).

*C. Irrigation and Drainage Facilities* :

(i) (a) & (b) : Available from 1968 *Rabi* onwards. (ii) Natural surface drainage exists.

*D. Soil type and Soil analysis* :

(i) Depth-(Up to 150cm.) : Colour-Very dark grey to black ; Structure-Poor, Angular blocky. (ii) Chemical analysis :

| Depth in cm. | pH. 1 : 10 | Water Soluble salts ppm of soil | | | | Water soluble Boron ppm. | Avl. $P_2O_5$ ppm. (Olsen's) | Avl. Mo. ppm. | Total $P_2O_5$ % | $CaCO_3$ % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | $CO_3$ | $HCO_3$ | Cl | $SO_4$ | | | | | |
| 0— 30 cm. | 9·20 | 66 | 863 | 14 | Tr. | 0·70 | 2·1 | 0·135 | 0·052 | 12 48 |
| 30— 60 cm. | 9·30 | 93 | 997 | 23 | Tr. | 1·26 | 1·9 | 0·233 | 0·052 | 13·43 |
| 60— 90 cm. | 8·30 | 84 | 909 | 89 | 36 | 2·83 | 2·3 | 0·550 | 0·057 | 13 90 |
| 90—120 cm. | 8·55 | Tr. | 366 | 447 | 679 | 2 83 | 4 6 | 0 646 | 0·066 | 14·77 |
| 120—150 cm. | 8·80 | Tr. | 488 | 536 | 392 | 3.28 | 7·4 | 0·670 | 0·070 | 21·14 |

Note :—Total Nitrogen ranges from 0·20% to 0·30%. Organic Carbon from 0 15 to 0·50% Exchangable Potassium ranges from 0·59 me/100 gm. to 0·72 me/100 gm. soil and Ex. Na from 0·30 to even 9·57 me/100 gm. soil. Total exchange capacity remains 1 me/gm. of clay throughout the profile.

*(iii) Mechanical analysis :

| Depth in cm. | % Constituents | | | | |
|---|---|---|---|---|---|
| | Moisture | Coarse sand | Fine sand | Silt | Clay |
| 0-30 | 5.21 | 10·87 | 10·08 | 13·50 | 47·50 |
| 30-60 | 5·92 | 8·21 | 8·51 | 13·75 | 51·00 |
| 60-90 | 6·36 | 5·19 | 7·77 | 11·87 | 53·13 |
| 90-120 | 6·35 | 3·13 | 6·50 | 13·12 | 55·00 |
| 120-150 | 6·62 | 3·04 | 6·40 | 7·00 | 56·00 |

*Sampless corresponding to the profile analysed for the chemical constituents.

*E. No. of Experiments* :

*Jowar*-10, Korra-4, Green gram-1, Cotton-17, Mixed cropping-2 ; Total=34

## 9. Agricultural Reaearch Station, Bijapur.

*A. General Information* :

(i) In Bijapur taluka of Bijapur district, 9.6 km. from Bijapur R. S. with Lat.-16°-60′ N/Long.—75°-46′ E/Alt.—592.5 m. above m.s.l. The general slop of the farm area is to the north-east. In this direction the average slop is about 1.37 percent. In other directions, the slop varies from 1.10 to 2.5 percent. The farm area has been contour bounded. (ii) Northern Arid tract of Mysore State. The climate can be said to be sub-tropical with well defined seasons. Annual average rainfall is about 54 cm. which is very uncertain and erractic. Maximum temperature reaches about 41°C during May and minimum goes to 13°C during December. (iii) Established in 1933. (iv) System of cropping is mainly rainfed. Rainfall during *Kharif* season i.e. June to August is very low and hence very small area is put under groundnut, bajra, greengram and green manure crops. Most of the rainfall is received during Sept.-Oct. and hence *Rabi Jowar*, wheat, and gram are grown on a large scale. *Jowar*-Gram and *Jowar*-Wheat-Gram are the usual rotations. Cotton has been introduced very recently. (v) Agronomy and Plant Breeding (mainly varietal yield trails),

*B. Normal Rainfall* :

| Jan. | | Feb. | | March | | April | | May | | June | | July | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| — | — | — | 0.6 | — | 1.1 | 3.8 | 0.7 | 1.6 | 4.1 | 3.5 | 4.9 | 2.5 | 6.0 |

| Aug. | | Sept. | | Oct. | | Nov. | | Dec. | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | |
| 3.3 | 4.2 | 6.9 | 13·8 | 7.0 | 4.3 | 2.0 | 0.3 | 0.7 | 0.1 | 71.4 |

(Av. fortnightly rainfall in cm., based on the data for the period 1964-65).

*C. Irrigation and Drainage Facilities* :

(i)(a) and (b) : No large scale irrigation facilities exist. However a small area of about 0.4 to 0.8 ha. is given protective irrigation from a well constructed in 1960 for drinking water. (ii) This problem does not exist on the farm. However excess water flow out through waste-weirs provided at suitable points as per contour plan.

*D. Soil type and Soil analysis* :

(i) Broad soil type (1) Medium Black (2) Limy; Depth (Agricultural)—(1) 1.5 to 1.8 m. —(2) 0.9 to 1.2 m., Colour—Black; Structure—Clayey

(ii) Chemical analysis :

| Item of analysis | Medium Black soil | | Limy soil | |
|---|---|---|---|---|
| | 0-23 cm. | 23-45 cm. | 0-23 cm. | 23-45 cm. |
| pH. | 8.73 | 8.90 | 8.23 | 8.35 |
| T.S.S. (mhos/cm.) E.C.M. | 0.66(N) | 0.7(N) | 0.41(N) | 0.35(N) |
| Organic carbon (%) | 0.54(M) | 0.60(M) | 0.50(M) | 0.38(L) |
| CaO (%) | 1.21 | 1.18 | 1.69 | 1.77 |
| Available N(%) | 0.0021 | 0.0018 | 0.0034 | 0.0056 |
| Available $P_2O_5$ (Kg/ha.) | 2.46(L) | 8.4(M) | 1.9(L) | Traces to 1.7(L) |
| Available $K_2O_5$ (Kg/ha.) | 270.8(M) | 375.4(H) | 451.6(H) | 397.9(H) |

L=Low; M=Medium; N=Normal; H=High.

(iii) Mechanical Analysis : N.A.

*E. No. of Experiments* :

Wheat—10, *Jowar*—26, *Bajra*—7, Gram—1, Groundnut—4 ; Total=48.

## 10. Coffee Research Station, Chethally.

*A. General Information* :

(i) In Somwarpet taluka of Coorg distt, 113.4 km. from Mysore Rly. Stn,. with Lat.—12°-30′ N/Long.—75°-80′ E/Alt.—914 m. The topography of the experimental area is gently sloping hilly region. (ii) Coorg—hilly region. (iii) Established in 1947. (iv) Coffee under multi shade as perennial crop. (v) Research on agronomical aspects and diseases of coffee.

*B. Normal Rainfall*

| Jan. | | Feb. | | March | | April | | May | | June | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| 7.8 | 10.0 | — | 1·0 | 0.1 | 1.7 | 4.9 | 8.6 | 5.8 | 13 6 | 10.6 | 12.7 |

| July | | Aug. | | Sept. | | Oct. | | Nov. | | Dec. | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | |
| 48.6 | 25.7 | 36.0 | 12.2 | 4.7 | 5.4 | 8 6 | 10.5 | 3.9 | 0.4 | 10.3 | 0.1 | 285.2 |

(Av. monthly rainfall in cm., based on the data for the period 1960-64)

*C. Irrigation and Drainage Facilities* :

(i) (a) and (b) No irrigation facilities. (ii) Yes, proper drainage system exists.

*D. Soil type and Soil analysis* :

(i) Board soil type—Sandy loam; Depth—deep; colour—Dark brown to black. (ii) Chemical analysis : pH. 7.0 ; Organic carbon %–2.7 ; Av. $P_2O_5$—7.8 Kg/ha. ; Av. $K_2O$—325 Kg/ha. (iii) Mechanical analysis :—N.A.

*E. No of Experiments* :

Coffee—24; Total=24.

## 11. Regional Fruit/Species Research Station, Chethalli.

*A. General Information* :

(i) In Coorg district, nearest Rly. Stn., is Mysore with Lat.-12° 30′/Long.-75° 80′/Alt. 3,100 M. above m.s.l. Levels to gentle slope. (ii) Sub-tropical area. Moderately high humidity during rainy days. (iii) Established in 1947. (iv) Planted perennial crops viz., Citrus, Mango, Sapota, Pineapple and other fruit crops. (v) (a) Citrus : Rootstock trial ; N, P and K trials ; Irrigational trials : Cultural trials : Weedicide trials ; Fungicide trials for Powdery mildew ; Shade and Pineapple mulching experiments ; Collection of important species and varieties (b) Pineapple : spacing-cum-fertilizer trials. (c) Paddy : Spacing-cum-fertilizer trials. (d) Species : Manurial trials ; Micronutrient trials ; varietal collection. (e) Fruits : Collection of different fruit crops.

*B. Normal Rainfall :*

Same as for Coffee Research Station, Chethalli.

*C. Irrigation and Drainage Facilities :*

(i) (a) Since 1947. (b) River (Pumped out of 35 HP motor). (ii) Yes ; there is a proper drainage system.

*D. Soil type and Soil analysis :*

(i) Broad soil type : Cley Loam with plenty of organic matter ; colour, black ; Structure fine ; Depth 50 cm.

| (ii) Chemical analysis : | *Layer*<br>0 to 23 cm. | *Layer*<br>23 to 45 cm. |
|---|---|---|
| N | 0·173627-2287% | 0·1736-2113% |
| $P_2O_5$ | 0·0810-·0112% | 0·0009-·0109% |
| $K_2O$ | 0·0127-·0716% | 0·0130-·0633% |

(iii) Mechanical analysis : Fine to coarse with plenty of organic matters.

*E. No. of Experiments :*

Cardmom-5, Pepper-1, Citrus-19 ; Total=25.

## 12 Agricultural Research Station, Dhadesaugar.

*A. General Information* to*D. Soil type and Soil analysis :*

Details N. A.

*E No. of Experiments :*

Paddy 2, *Jowar*-2, Sugarcane-1, Cotton-1 ; Total=6.

## 13. Agricultural Research Station /Agri. College. Farm, Dharwar.

*A. General Information :*

(i) In Dharwar taluka of Dharwar district, Lat. 15·27° N/Long.-76·6° E/Alt.-782 M. The lands of the central portion of the farm area are in level and uniform in its characters. The lands at the frings of the central area are undulating and low lying and soil conservation measures have been undertaken to check soil erosion, (ii) Transition tract of Dharwar division. (iii) Established in 1904. (iv) *Kharif jowar* followed by cotton. (v) Programme of research is to evolve a variety of *'Desi'* cotton superior to *Suyadhar* in yield and ginning percentage besides being resistant to wilt disease and agronomic expts.

*B. Normal Rainfall :*

| Jan | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| — | — | 0·1 | 5·0 | 10·8 | 9.4 | 18·7 | 10·4 | 10·2 | 16·5 | 3·5 | 0·8 | 85·4 |

(Av. fortnightly rainfall in cm., based on the data for the period 1950-70).

*C. Irrigation and Drainage Facilities* :

(i) (a) & (b) : Nil. (ii) Natural drainage system exists.

*D. Soil type and Soil analysis* .

(i) Medium black soil 0·91 m. to 1·07 m. deep while clayey and reddish black soils are 0·61 m. to 0·76 m. deep and porous. (ii) Chemical analysis : pH. 7·3 ; available $P_2 O_5$-24·1% ; Ca $O_3$-6·26% ; total N- 0·083%. (iii) Mechanical analysis : Sand-5·6% ; silt-9·3%; clay-62·5% and moisture-8·20%.

*E. No. of Experiments* :

Paddy-5, wheat-9, *Jowar*-21, Maize-3, Cotton-38, Groundnut-19, Grass-16, Chillies-1, Mixedcropping-7, Rotational-1 ; Total=120.

## 14. Agricultural Research Station, Gadag.

*A. General Information* :

(i) In Gadag taluka of Dharwar district, nearest R. S. Gadag with Lat.-15° 25′ N/Long.-75°38′ E/Alt.-649 m. The topography of the experimental area is fairly flat lands. (ii) Medium black soils. (iii) Established in 1957. (iv) Cotton rotated with *Jowar*, G. Nut and Wheat. (v) Breeding and Agronomic aspects of cotton cultivation.

B. *Normal Rainfall* :

| Jan. | | Feb. | | March | | April | | May | | June | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| — | — | — | 0.5 | — | 1.3 | 1.7 | 5.1 | 2.0 | 6.6 | 4.8 | 4.9 |

| July | | Aug. | | Sept. | | Oct. | | Nov. | | Dec. | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | |
| 2.4 | 5.1 | 3.8 | 3.8 | 5.1 | 11.7 | 8.5 | 5.5 | 0.5 | — | 2.1 | — | 75.4 |

(Av. fortnightly rainfall in cm., based on the data for the period 1960-64).

*C. Irrigation and Drainage Facilities* :

(i) & (ii) No.

*D. Soil type and Soil analysis* :

(i) Depth-1.52 m. to 3·05 m. ; Colour-Medium black ; Structure-Clayey. (ii) Chemical analysis :—

| | 0-15 cm. | 15 45 cm. | 45-60 cm. |
|---|---|---|---|
| pH. | 8·1 | 8·4 | 8·5 |
| Total N% | 0·035 | 0·028 | 0·016 |
| Available $P_2O_5$ | 2·72 | 2·60 | 1·85 |
| Exchangable CaO | 23·74 | 20·25 | 25·54 |
| Humus% | 0·049 | 0·061 | 0.065 |
| Organic C% | 0·79 | 0·80 | 0·78 |
| Total soluble salts. | 0·258 | 0·298 | 0·267 |

(iii) Mechanical analysis :

| | | | |
|---|---|---|---|
| Stones% | 13·89 | 19·38 | 21·09 |
| Sand% | 5·99 | 7·12 | 6·40 |
| Silt% | 13·07 | 9·75 | 11·85 |
| Clay% | 55·25 | 64·12 | 54·00 |
| Moisture% | 9·10 | 8·68 | 9.11 |

*E. No. of Experiments* :

Cotton-30, Rotational-1 ; Total=31

### 15. Agricultural Research Station/Regional Sugarcane Res. Stn., Gangavati.

*A. General Information :*

(i) In Gangavati taluka of Raichur district, 35 Km. from Ginigera R.S. with Lat.-15°-15'-40″ N/Long.-76°-31′-45″ E. The soils are typical medium black soil swith a depth ranging from 45 cm. to 90 cm. The soils are alkaline in nature with clay content from 40 to 55 percent. The soils crack heavily in summer. Most of the area is levelled. (ii) It represents southern peninsular T. B. P. Tract. (iii) Established in 1956. (iv) *Kharif* :—Hybrid Maize, Hybrid *Jowar*, Hybrid *Bajra*, Setaria K-221-1 purna, Ragi H. R 35 and Paddy. *Rabi* :—Mexican wheat, Bengal gram, chaffe sufflower A 300, Bajra HB-1 D 174, Jower CHS-1. Transplanted Ragi, purna setaria, Cotton, *Laxmi* Sugarcane Co 419. (v) (a) Thomas Phosphate Trial. (b) Manure-cum Spacing-cum-Seed with Co. 740 & 997. (c) Deteriorated V/s Non-deteriorated seed material. (d) Role of F. Y. M. & Oil Cakc on Sugarcane manuring. (e) Replacement of organic manure with inorganic manure. (f) Effect of different phosphatic fetilizer and their relative efficiency in yield and quality of cane.

*B. Normal Rainfall :*

| Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| — | — | — | 4·3 | 23·0 | 39·4 | 85·4 | 87·0 | 137.1 | 90·0 | 15·0 | 15·2 | 496·4 |

(Av. monthly rainfall in cm., based on the data for the period 1960-65)

*C. Irrigation and Drainage Facilities :*

(i) (a) & (b) : Yes, Since 1956. (ii) Yes, proper drainage system exists.

*D. Soil type and Soil analysis :*

(i) Depth 45 to 90 cm.; Clour-B.C. Soil; Structure- 40 to 35% Clay soils, crack heavily in summer. (ii) Chemical analysis and (iii) Mechanical analysis : N.A.

*E. No. of Experiments :*

Wheat-6, *Jowar*-4,Sugarcane-15, Cotton-2, Groundnut-6 ; Total=33.

### 16. Horticultural Farm, Gonicoppal.

*A. General Information :*

(i) In Virajpet taluka of Coorg distt., 90 Km. from Mysore Rly Stn. with Lat.—12°N/Long.—75°E/Alt.—884 M. above m.s.l. Gentle sloping towards North-west. (ii) Malnad tract. (iii) Established in 1954. (iv) Perennial crop, variety Coorg Orange start bearing from 6 to 10 years. (v) Survey and assessment of the extent of damage of the die-back disease on Coorg orange working out various measures by field studies.

*B. Normal Rainfall :*

| Jan. | | Feb. | | March | | April | | May | | June | | July | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| 0.4 | — | — | 1.1 | — | 1.1 | 4.0 | 5.2 | 6.5 | 14.6 | 15.0 | 21.4 | 79.3 | 24.0 |

| Aug. | | Sept. | | Oct. | | Nov. | | Dec. | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | |
| 31.3 | 10.7 | 7.3 | 9.8 | 7.2 | 11.3 | 3.0 | 1.4 | 1.6 | 0.2 | 256.4 |

(Av. fortnightly rainfall in cm., based on the data for the period 1960-65).

*C. Irrigation and Drainage Facilities ;*

(i) (a) and (b) Yes, since 1954, sprinkler have been made available since 1968. (ii) Yes, proper drainage system exists.

D. *Soil type and Soil analysis* :

(i) Broad soil type.

| Depth in cm. | Description | pH. |
|---|---|---|
| 0— 23 | Black loam | 6.0 |
| 23— 61 | Dark Grey sandy loam. | 6.5 |
| 61— 97 | Reddish loam sandy brown. | 5.5 |
| 97—108 | Blue Black concretions. | 4.0 |
| 108—115 | Laterised soil loamy. | 4.2 |

(ii) Chemical analysis :

| Depth | 0—23 cm. | 23—45 cm. | 45—70 cm. |
|---|---|---|---|
| Moisture (on airdry basis) | 0.7100 | 2.7575 | 2.8925 |
| Loss on Ignition. | 9.0420 | 8.1930 | 8.3510 |
| $SiO_2$ | 76.9336 | 76.3820 | 73.9264 |
| $Al_2O_3$ | 9.2441 | 11.0913 | 13.5762 |
| $Fe_2O_3$ | 5.2328 | 6.0022 | 6.7281 |
| CaO | 0.1895 | 0.1666 | 0.1607 |
| MgO | 0.1524 | 0.1248 | 0.1154 |
| Total $P_2O_5$ | 0.1106 | 0.1016 | 0.0600 |
| Total $K_2O$ | 0.0168 | 0.0137 | 0.0106 |
| Available $P_2O_5$ | 0.0051 | 0.0041 | 0.0037 |
| Available $K_2O_5$ | 0.0061 | 0.0057 | 0.0047 |
| Organic carbon | 1 5890 | 0.8586 | 0.5562 |
| Nitrogen | 0.1078 | 0.0734 | 0.0562 |
| C/N | 15.1200 | 12.0200 | 10.2100 |

(iii) Mechanical anaylsis :

| Depth | 0—23 cm | 23—45 cm | 45—70 cm. |
|---|---|---|---|
| Coarse sand | 36.170 | 34.300 | 31.890 |
| Fine sand | 22.920 | 10.280 | 19.360 |
| Silt | 9.200 | 9.003 | 8.569 |
| Clay | 30.680 | 35.970 | 40.150 |
| Water holding capacity | 50.200 | 52.950 | 63.400 |
| pH. | 6.4 | 6.3 | 6.5 |
| Taxture | Sand clay loam. | Sand clay loam. | Sandy clay |

E. *No. of Experiments* :

Citrus—29 ; Total=29.

## 17 Agricultural Research Station, Hagari

A. *General Information* :

(i) In Bellary Distt., Rly. Stn. Hagari with Lat.—15°-10′/Long.—77°—04′E/Alt.—413.3 M. Eastern block of the farm has a maximum of 1% slope from east to west while the western block is fairly levelled. (ii) The research station is located in the heart of a typical arid zone of south central India with annual rainfall of 537 m.m. and soil type being medium black to heavy black cotton soils. (iii) Established in 1906. (iv) *Kharif* : (June-Sept.) If sufficient soil soaking heavy rains are received the following crops are grown (1) Setaria (2) Bajra (3) Cotton. But such heavy rains are normally rare and late *Kharif* rains of 'August-Sept.' are made use of to grow mixed crop of cotton : setaria in 1 : 2 ratio while Bajra is grown as a pure crop. (v) *Rabi* : Sept.-February. The following pure crops are grown :

Grains—*Jowar* and Wheat ; Fibre—Cotton ; Oil Seeds—Sufflower and Linseed ; Pulse—Bengalgram ; Condiments—Corriander.

(v) Varietal and Agronomic trial on Setaria, *Jowar*, Sufflowar, *Bajra* and Cotton.

*B. Normal Rainfall* :

| Jan. | | Feb. | | March | | April | | May | | June | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| — | — | — | 0.2 | 0.1 | 0.1 | 1.1 | 1.6 | 1.4 | 4.9 | 3.0 | 1.9 |

| July | | Aug. | | Sept. | | Oct. | | Nov. | | Dec. | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | |
| 1.4 | 4.0 | 2.1 | 4.4 | 1.9 | 10.1 | 8.3 | 4.4 | 1.5 | 0.4 | 0.9 | — | 53.1 |

(Av. fortnightly rainfall in cm. based on the data for the period 1952-71).

*C. Irrigation and Drainage Facilities* :

(i) (a) Yes, All total 5 wells fitted with electric motor pumpset, 2 wells existed before 1932, 3 more new cement ring wells suited for sprinkler irrigation have been commissioned with year 1971. (b) Sprinkler irrigation system. (ii) The irrigated lands (garden lands of Western block) being fairly levelled drainage facilities lacking in times of heavy rainfall.

*D. Soil type and Soil analysis* :

(i) Block cotton type of soil, 30 to 200 cm. in depth and Blocky in structure. (ii) Chemical anyalysis and (iii) Mechanical analysis : As below

(Analysed in 1962-63)

| Profile ptt. No. | Depth in cm. | pH. | T.S.S. | Coarse Sand % | Fine Sand % | Silt % | Clay % | Loss of solution | Organic carbon | Available $P_2O_5$ | Available $K_2O$ | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Profile Samole | 0-30 | 7·8 | 1·3 | 8·760 | 16·061 | 14·500 | 46·275 | 10·00 | 0·663 | Trace | 500 | |
| 2. | 30-61 | 7·8 | 1·1 | 8·860 | 21·518 | 12·250 | 43·50 | 9·91 | 0·307 | 0·6 | 500 | |
| 3. | 61-91 | 7·9 | 1·4 | 8·970 | 27·844 | 14·000 | 37·500 | 8·52 | 0·600 | Trace | 465 | |
| 4. Western Block | 91-122 | 7·9 | 1·3 | 6·518 | 47·754 | 13·475 | 30·750 | 6·920 | 0·429 | 0·9 | 500 | |
| 5. | 122-160 | 7·9 | 1·0 | 10·614 | 60·755 | 6·750 | 16·250 | 3·410 | 0·312 | 2·4 | 500 | |
| 6. | 160-170 | 8·2 | 0·3 | 35·649 | 55·296 | 2·900 | 3·900 | 1·155 | 0·117 | 1·5 | 475 | |
| 7. | 0-30 | 8·1 | 1·2 | 7·800 | 17·250 | 17·550 | 43·20 | 10·159 | 0·468 | 0·9 | 210 | |
| 8. | 30-61 | 8·2 | 0·85 | 8·177 | 17·690 | 12·625 | 46·375 | 11·350 | 0·429 | 2·1 | 290 | |
| 9. Eastern Block | 61-91 | 7·8 | 5·85 | 6·368 | 9·680 | 13·475 | 55·155 | 12·551 | 0·507 | 1·5 | 90 | |
| 10. | 91-122 | 7·8 | 5·00 | 4·901 | 8·280 | 13·700 | 59·625 | 9·670 | 0·312 | 1·5 | 237 | |
| 11. | 122-152 | 7·7 | 7·4 | 3·339 | 7·250 | 17·375 | 56·375 | 11·950 | 0·390 | 0·9 | 500 | |
| 12. | 152-208 | 7·9 | 4·6 | 4·163 | 13·430 | 11·825 | 59·625 | 10·345 | 0·195 | 3·0 | 335 | |

SOME SINGLE VALUES HAGARI OF SOILS

Samples from profile section

| Single Values | Deep Black soil in 30 cm. | 0-30 cm. | 30-60 cm. | 60-90 cm. | 90-120 cm. |
|---|---|---|---|---|---|
| Maximum water-holding capacity. | 63·1 | 52·2 | 54·9 | 64·4 | 54·9 |
| Apparent specific gravity. | 1·29 | 1·37 | 1·37 | 1·37 | 1·42 |
| Real specific gravity. | 2·35 | 2·18 | 2·17 | 2·22 | 2·32 |
| Pore space | 66·5 | 52·2 | 54·0 | 57·0 | 55·1 |
| Volume expansion. | 22·1 | 26·2 | 28·6 | 38·7 | 30·7 |

*E. No. of Experiments* :

*Jowar*—2, Cotton—4 ; Total=6.

### 18. Agricultural Research Station/Agricultural College Farm, Hallal.

*A. General Information :*

(i) In Bangalore-north taluka of Bangalore district, 6.5 Km. from Bangalore City Rly. Stn. with Lat.—13°N/Long.—77-37°E/Alt.—899 m. Most of the rainfed area is suituated at an elevated place and the plots are slopy towards north i.e. (South to North). (ii) It represents Sami-dry tract. (iii) Established in 1904. (iv) (a) Single crop under rainfed area mainly in *Kharif* seasons. (b) Double crop under irrigated areas. (v) Research problems taken on Ragi, Sugarcane, Oilseeds, Paddy, in all aspects as decided by the Research Council.

*B. Normal Rainfall :*

| Jan. | | Feb. | | March | | April | | May | | June | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| 0.5 | — | 0.4 | — | — | 0.8 | 3·7 | 2.3 | 4.1 | 5.3 | 3.3 | 3.7 |

| July | | Ang. | | Sept. | | Oct. | | Nov. | | Dec. | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | |
| 2.3 | 8.2 | 4.1 | 8.1 | 9.1 | 9.6 | 10.5 | 6.0 | 5·2 | 2.0 | 1.2 | 0.2 | 90.6 |

(Av. monthly rainfall in cm., based on the data for the period 1960—64).

*C. Irrigation and Drainage Facilities :*

(i) (a) and (b) Available for only a part of the area (5.7 ha.) (ii) Yes, Proper drainage system exists.

*D. Soil type and soil analysis :*

| (i) Broad soil types— | Dryland | Wet land. |
|---|---|---|
| Depth— | 0.91 m. | 1.52 m. |
| Colour— | Red | Ash |
| Structure— | Sandy loam | Alluvial |

| (ii) Chemical analysis : | Dry Land | Wet Land |
|---|---|---|
| (a) Exchangable basis | Fairly well supplied | Fairly well supplied |
| (b) Soluable salts | Low | Low |
| (c) Organic matter | Low | Medium high |
| (d) Phophoric acid | poor | —do— |
| (e) Available Potash | Fairly well supplied | Fairly well supplied |

(iii) Mechanical analysis :—N.A.

*E. No. of Experiments :*

Paddy—21, Ragi—26, Groundnut—4, Chillies—1, Mixed Cropping—2, Total=54.

### 19. Arecanut Research Station, Hirehally.

*A. General Information* to *D. Soil type and Soil analysis :*

Details—N.A.

*E. No. of Experiments :*

Arecanut—1 ; Total=1.

### 20. Agricultural Research Station, Hiriyur.

*A. General Information ;*

(i) In Hiriyur taluka of Chitradurga district, 40 Km. from Chitradurga R.S. with Lat.—13° 57′ 32″ N/Long.—76° 37′ 38″ E/Alt.—610 M. (ii) Dry and Wet tract. (iii) Established in 1916. (iv) Paddy—Sugarcane ; Paddy—Paddy. ; Paddy—Ragi ; Cotton—Rabi Jowar ; Cotton—Tur ; *Rabi*—Jowar—Castor, Paddy—Groundnut. (v) Agronomic experiments on Castor, Ragi, Sugarcane and Coconut.

*B. Normal Rainfall* :

| Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0·5 | 2·4 | 22·3 | 37·3 | 70·5 | 32·7 | 71·6 | 37·8 | 67·3 | 144·6 | 24·3 | 28·7 | 540·0 |

(Av. monthly rainfall in mm. based on the data for the period 1960-64).

*C. Irrigation and Drainage Facilities* :

(i) (a) and (b) : Yes, since 1916 irrigation facilities are available. (ii) Yes, proper drainage system exists.

*D. Soil type and Soil analysis* :

(i) Broad soil type—Red soils, DBC soils, and laterite soils ; Depth—Shallow, deep and medium soils ; Colour—Red and Black ; Structure—Loose, sticky and compact. (ii) Chemical analysis : pH.—7.4 to 9.5 ; T.S. (ppm)—210 to 3010. (iii) Mechanical analysis : N.A.

*E. No. of Experments* :

Paddy—3, Ragi—5, Sugarcane—6 ; Total=14.

### 21. Tabacco Research Station, Hunsur.

*A. General Information* :

(i) In Hunsur Taluka of Mysore District, 23 Km. from Krishna Raja Nagara Rly. Stn. and 45 Km. from Mysore Rly. Stn. with Lat.—12°-17′-55″N/Long.—76°-17′-35E/Att. 826 M. above m.s.l. It is situated on the side of the hillock, sloping to the west and is hence terraced consequently all the main plots are longer (North-South direction) than broad. (ii) It represents Semi-Malnad tract mostly under rainfed conditions with small trees and open scrab and dense scrab in many regions. The soils are mostly light, sandy to gravelly in texture, reddish to light brown in colour and with poor fertility. (iii) Established in 1957. (iv) Normally two crops in an year are cultivated under rainfed conditions. The first cropping period is from April to September and the Second period is from October to January. Main crops are *Beedi* tobacco, late Ragi (Hine ragi), Horse gram, Corriander, Bengalgram and Niger. (v) Programme of work include Agronomical, Botanical and Pathological Research on flue cured Virginia, burley and *Beedi* tobacco.

*B. Normal Rainfall* :

| Jan. | | Feb. | | March | | April | | May | | June | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| 0.1 | 0.4 | 0.7 | — | 0.1 | 1.6 | 2.6 | 5.6 | 6.0 | 7.1 | 2.5 | 3.0 |

| July | | Aug. | | Sept. | | Oct. | | Nov. | | Dec. | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | |
| 10.4 | 4.9 | 6.4 | 2.3 | 2.3 | 3. | 7.9 | 5.4 | 2.9 | 0.7 | 3.4 | 0.1 | 79.6 |

*C. Irrigation and Drainage Facilities* :

(i) (a) and (b) : An underground source of water had been located in 1967. It is hoped that after proper binding and deepening of the region, sufficient water will be available for irrigation in the near future. (ii) Ordinary surface drainage is available in all the plots. A few fields having poor sub-soil drainage were provided with artificial under ground rubble drainage system during 59-60 which are working satisfactorily so far.

*D. Soil type and Soil analysis* :

(i) Broad soil types : Light ; Depth—30 to 91 cm. : Colour—Reddish mostly ; Structure—Gravelly and sandy. (ii) Chemical analysis and (iii) Mechanical analysis—Details N.A.

*E. No. of Experiments* :

Tobacco—6 ; Total=6.

## 22. Regional Research Station/Sugarcane Research Station/Agricultural Research Station, Mandya.

*A. General Information :*

(i) In Mandya taluka of Mandya distt., 11 Km. from Mandya R.S. with Lat.—12°-58′-13″ N/Long.—76°-49′-36″ E/Alt.—698 M. 1st Category-High level shallow red soil. IInd-category-intermediate reddish yellow medium soil. IIIrd-category-low lying grayish. (ii) Red soils tract. (iii) Established in 1931-32. (iv) 1. Paddy, (Experiments) ; 2. paddy (General) ; 3. Ragi Expts ; 4. Ragi (General) ; 5. Sugarcane (Expts.) Ratoon ; General, Hybrid maize, Horsegram, Cotton, Fodder, Banana, Coconut, Groundnut, Sunhemp, Wheat, Barley etc. (v) Agronomic experiments on several crops.

*B. Normal Rainfall :*

| Jan. | | Feb. | | March | | April | | May | | June | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| — | — | 1.1 | 5.3 | — | 8·5 | 29.5 | 58.5 | 56.5 | 67.7 | 32.5 | 25.3 |

| July | | Aug. | | Sept. | | Oct. | | Nov. | | Dec. | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | |
| 23.3 | 23.2 | 24.8 | 42.6 | 59.0 | 46.9 | 100.3 | 139.3 | 49.9 | 4.2 | 24.5 | 0.7 | 823.8 |

(Av. monthly rainfall in cm, the period on which the data based, is not available).

*C. Irrigation and Drainage Facilities :*

(i) (a) Since 1932-33. Irrigation facilities are available. (b) N.A. (ii) Crossed drainage system is existing.

*D. Soil type and Soil analysis :*

(i) Broad soil types : High level-shallow red soil ; Reddish yellow for medium soil, for low lying grayish black clay soils, Sandy loam to granular in structure.

(ii) Chemical analysis :

(a) Category I : Water table 91 cm. topography gentle to sharp slope.

| | pH. | Total soluble Salt | Calcium carbonate | Exchange Calcium | Homus % | Available $P_2O_5$ (Kg/ha.) | Available $K_2O$ (Kg/ha.) | Total N | Organic carbonates | C.N. ratio |
|---|---|---|---|---|---|---|---|---|---|---|
| 0-25 cm. | 6.4 | 0.2 | 0.6 | 14 | 0.74 | 22 | 94 | 0.051 | 0.60 | 11.7 |
| 25-50 cm. | 6.2 | 0.25 | 0·8 | 15.75 | 0.51 | 18.8 | 170.3 | 0.039 | 0.28 | 7.21 |

(b) Category II : water table 75 cm. topography gentle slope.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 0-30 cm. | 6.0 | 0.20 | 0.40 | 7.25 | 0.3 | 4.5 | 304.9 | 0.056 | 0.60 | 10.7 |
| 30-50 cm: | 6.1 | 0.20 | 0.5 | 13.5 | 0.16 | 14.8 | 107.6 | 0.049 | 0.54 | 11.2 |

(c) Category III : water table 91 cm. topography flat.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 0-23 cm. | 8.0 | 0.30 | 0.4 | 19.15 | 0.63 | 19.9 | 349.7 | 0.065 | 0.61 | 7.85 |
| 23-55 cm. | 7.8 | 0.30 | 2.5 | 19.75 | 0.42 | 13.4 | 421.4 | 0.044 | 0.31 | 7.50 |

(iii) Mechanical anaylsis : Coarse sand—40.90% ; Fine sand—34.00% ; Silt—4.60% ; Clay—17.75%.

*E. No. of Experiments :*

Sugarcane—71, Castor—3 ; Total=74.

## 23. Paddy Breeding Station/Agricultural Research Station, Mangalore.

*A. General Information* :

(i) In Mangalore taluka of South Kanara distt., 4 Km. from Mangalore R.S. with Lat.—13°N/Long.—75° E/Alt.—30 M. Most of the experiments are laid out in low lying double crop land and few of the experiments in top lands. (ii) West coast of Mysore State. (iii) Established in 1945. (iv) Paddy-paddy-paddy (3 crops sequence. (v) Agronomic, Entomologcal, Plant Breeding studies etc.

*B. Normal Rainfall* :

| Jan. | | Feb. | | March | | April | | May | | June | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 2 |
| — | — | — | 1·5 | 0·5 | 0·6 | 2·1 | 2·0 | 3·2 | 21·3 | 36·1 | 34·2 |

| July | | Aug. | | Sept. | | Oct. | | Nov. | | Dec. | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | |
| 48·7 | 56·4 | 52·7 | 33·4 | 22·5 | 28·6 | 8·3 | 19·2 | 4·2 | 0·7 | 1·4 | 1·4 | 378·9 |

(Av. fortnightly rainfall in cm., based on the data for the period 1960-64).

*C. Irrigation and Drainage Facilities* :

(i) (a) and (b) : 5 (Small and shallow) tanks constructed in 1959. (ii) Channels round about the fields.

*D. Soil type and Soil anylysis* :

(i) Broad soil types-Sandy loam ; Depth—30 to 45 cm. ; Colour—Red ; Structure-Latritic.

(ii) Chemical analysis :

| *Contituents* | *Percent* | *Constituents* | *Percent* |
|---|---|---|---|
| Loss on ignition | 7·88 | Soda N | 0·122 |
| Insoluble | 72·14 | Sulphuric acid | 0·118 |
| Iron oxide $F_2O$ | 7·37 | Moisture | 1·5 |
| Alumina $Al_2O_3$ | 11·57 | Nitrogen | 0·10 |
| Lime CaO | 0·064 | Available $K_2O$ | 0·019 |
| Magnesia | 0·055 | Available $P_2O_5$ | 0·006 |
| Total Potash $K_2O$ | 0·198 | pH. Value | 5·6 |
| Tolal $P O_5$ | 0·129 | | |

(iii) Mechanical analysis :

| | |
|---|---|
| Clay | 24·5% |
| Silt | 19·7% |
| Fine sand | 7·4% |
| Coarse sand | 47·8% |
| Acid soluble | 0·6% |

*E. No. of Experiments* :

Paddy—87 ; Total=87.

## 24. Cardamom Research Station, Mudigere.

*A. General Information* :

(i) In Mudigere taluka of Chikkamagalur distt., 72 Km. from Kadur R.S. with Lat. 13·12° N/Long. 75·63 E/Alt. 945 M. Hill slopes and bed of the valleys. (Hanal). (ii) Malnad tract. (Hilly tract). (iii) Established in 1957. (iv) Only perennial crops, since this was a Cardamom Research Station. (v) (a) Establishing transmissson of '*Katte*' through the insect *Pontalonia nigronervosa.* (b) To study whether the disease is transmitted through seed. (c)

*C.* Evaluation of eradication of diseased plants and replanting with healthy seedlings as a method of control. (d) Survey of the Cardamom area in Chikkamagalur Distt. with a view to assess the role of weather and disease as factors threatening the Cardamom plantations.

*B. Normal Rainfall* :

| Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| — | 0·6 | 1·9 | 8·2 | 22·5 | 43·3 | 118·1 | 58·0 | 20·3 | 28·9 | 6·0 | 2·7 | 310·6 |

(Av. monthly rainfall in cm., based on the data for the period 1960-64).

*C. Irrigation and Drainage facilities* :

(i) (a) and (b) No irrigation facilities are available. (ii) N.A.

*D. Soil type and Soil analysis* :

(i) Broad soil types—Red and lateritic types ; Depth-very deep ; Colour—Yellowish-red to red : Structure—Single grain to granular. (ii) Chemical analysis : N.A. (iii) Mechanical analysis : Sand—56% ; Silt—28·5% ; Clay—15%, (Average).

*E. No. of Experiments* :

Cardamom—7 ; Total=7.

### 25. Agricultural Research Station, Mugad.

*A. General Information* :

(i) In Dharwar taluka of Dharwar distt., nearest R.S., Mugad with Lat.—16-65° N/Long.—74·50° E/Alt.—701 M. The trials were laid out on low lands. (ii) Drilled paddy tract of Malnad region. (iii) Established in 1923. (iv) Paddy is taken as rainfed drilled crop. (v) Botanical, Agronomical experiments on paddy.

*B. Normal Rainfall* :

| Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| — | 0·1 | 0·9 | 3·8 | 15·1 | 13·4 | 33·3 | 18·1 | 13·4 | 9·6 | 1·4 | 1·2 | 110·3 |

(Av. monthly rainfall in cm., based on the data for the period June 1959 to May 1966).

*C. Irrigation and Drainage Facilities* :

(i) No irrigation facilities are available. The irrigation tank situated by the side of the farm is under the control of village panchayat. (ii) Drainage system is not existed at present.

*D. Soil type and Soil analysis* :

(i) Broad soil type : Depth—15 to 73 cm ; Colour—light red to medium black ; Structure—Sandy loam to sandy clay. (ii) Chemical analysis and (iii) Mechanical analysis. N.A.

*E. No. of Experiments* :

Paddy—21 ; Total=21.

### 26. I.S.A. Farm, Munirabad.

*A. General Information to D. Soil type and Soil analysis.*

Details N.A.

*E. No. of Experiments* ;

Sugarcane —1 ; Total=1.

### 27. Agricultural Research Station, Nagenahalli.

*A. General Information* :

(i) In Mysore taluka of Mysore distt., nearest R.S. Nagenahally with Lat.—12°—12′ N/Long.—76° —42′ E/Alt. 762 M. Level tract, of the channel area. (ii) Sandy loam soils of *Cauveri* Basin. (iii) Established in 1917. (iv) *Kharif* paddy, Pulses, Paddy (Sum). (v) (a) Agronomical trials on paddy. (b) University Uniform Veritial trials. (c) Nucleus seed production.

*B. Normal Rainfall* :

| Jan. | Feb. | March | April | May | June | |
|---|---|---|---|---|---|---|
| 1·7 | 0·8 | 2·5 | 6·5 | 12·3 | 4·2 | |
| July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
| 6·0 | 4·0 | 6·5 | — | 12·8 | 2·2 | 59·5 |

(Av. monthly rainfall in cm., based on the data for the period 1960-63).

*C. Irrigation and Drainage Facilities* ;

(i) (a) Irrigation facilities made available from K.R. Dam since 1924. (b) By tapping underground water through Bore Wells. (ii) Open drainage system provided in the entire experimental area.

*D. Soil type and Soil analysis* :

(i) Board soil type—Sandy loam to gravelly ; 30 to 60 cm. in depth and Red to grey in colour ; Structure—Well drained (loose). (ii) Chemical analysis : Organic matter—0.491 to 0·810 ; Soil pH.—4·8 to 5·6 ; Texture-pore light. (iii) Mechanical analysis: Clay—48·50 % ; Silt—10·10 ; Sand(F and C)—39·50.

*E. No. of Experiments* :

Paddy—54 ; Total=54.

### 28. Agricultural Research Station, Nargund.

*A. General Information* :

(i) In Nargund taluka of Dharwar distt., 33 Km. from Annigeri R.S. with Lat.—15·40° N/Long.—75·40° E/Alt. 808 M. above M.S.L. The experimental farm is undulating and sloping towards North to South, across which the contour bunds have been maintained. The soils are medium to light in colour and represents the typical *Karl* soil. (ii) Transitional tract. (iii) Established in 1946. (iv) Cotton, Wheat, *Jowar*. (v) Research on Reclamation of Alkaline soils.

*B. Normal Rainfall* :

| Jan. | | Feb. | | March | | April | | May | | June | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| — | — | — | 0·5 | — | 0·2 | 2·8 | 0·4 | 1·3 | 5·3 | 5·0 | 8·7 |

| July | | Aug. | | Sept. | | Oct. | | Nov. | | Dec. | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | |
| 2·4 | 8·4 | 2·9 | 2·0 | 5·9 | 9·3 | 7·8 | 4·6 | 1·1 | 0·3 | 1·4 | 0·3 | 70·6 |

(Av. fortnightly rainfall in cm., based on the data for the period 1960—64).

*C. Irrigation and Drainage Facilities* :

(i) (a) and (b) ; From the year 1968—69 the light irrigational programme will be started from the farm ponds. (ii) No.

D. *Soil type and Soil analysis* :

(i) Broad soil types : Depth—Medium ; Colour—Medium to Light black ; Structure-Upper layer fine texture but below 15 cm. salt *kankar* layer horizones. (ii) Chemical analysis : pH.—9—10 ; Total soluble salts—0·2 to 0·6 % Ex. Calcium 21 to 29 m.e. % ; Ex. Sodium 8 to 12 m.e. % ; Clay—40 to 50 % ; Moisture equivalent—40 to 50 % ; Lime Reserve—40 to 50 % ; Sodium saturation—20 to 25 % ; Organic carbon 0·44 % ; Available $P_2O_5$—0·004 to 0·015 %. (iii) Mechanical analysis : N.A.

E. *No. of Experiments* :

Wheat—17, *Jowar*—11, Cotton—15, Rotational—2 ; Total=45.

### 29. Agricultural Research Station, Nipani.

A. *General Information* :

(i) In Chikodi taluka of Belgaum distt., nearest R.S. Chikodi Road. with Lat.—18·2° N/Long—74·20° E/Alt.—610·8 M. The topography of experimental area have 0·5 to 1·0 % slope. (ii) Semi-arid tract. (iii) Established in 1938. (iv) Tobacco (Main), *Jowar* and Gr. Nut (Single Crop). (v) All India Co-ordinated Research Project on *Bidi* Tobacco on Breeding, Agronomy and Entomological aspects.

B. *Normal Rainfall* :

Average rainfall for a year is 77·5 cm. distributed in 10 months. (Av. of 36 years).

C. *Irrigation and Drainage Facilities* :

(i) (a) and (b) : Irrigation facility is available only for raising nursery and experiments on Irrigational trials. (*ii*) Fairly good.

D. *Soil type and Soil analysis* :

(i) Broad soil type : Medium Black, Sandy soils and Red soils with 2·44 m. depth. (ii) Chemical analysis : Chlorides—44 to 114 p.p.m. ; $CaCo_3$—1 to 7·5 % ; Organic Corbon—0·82 to 0·99 % ; $P_2O_5$—7·29 p.p.m. ; $K_2O$—70 to 300 p.p.m. (iii) Mechanical analysis : Sand 40 to 52 % ; Silt—30 to 35 % ; Clay—16 to 27 %.

E. *No. of Experiments* :

*Tobacco*—25 ; Total=25.

### 30. Agricultural Research Station, Ponnampet.

A. *General Information* :

(i) In Virajpet taluka of Coorg distt., with Lat.—12°N/Long.—76° E/Alt.—865 M. above M.S.L. The topography of the station is undulating with hills and valleys. The farm is situated in a cup like basin sorrounded by elevated ground alround the central basin. (ii) Mountains heavy rainfall tract. (iii) Established in 1951. (iv) Only one crop of paddy is raised in *Kharif* season solely as a rainfed crop supplemented with tank irrigation. Sometimes, if there is sufficient soil moisture, a green manure crop like *kolanji* or Scsbevia species is raised during pre-monsoon showers. Generally, paddy after paddy is the rotation in vogue. (v) Agronomical and selection work on paddy.

B. *Normal Rainfall* :

| Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| — | 0·9 | 2·0 | 4·8 | 10·8 | 39·5 | 94·1 | 55·9 | 11·5 | 17·0 | 8·9 | 2·9 | 248·3 |

(Av. monthly rainfall in cm., based on the data for the period 1959-65).

C. *Irrigation and Drainage Facilities* :

(i) (a) and (b) : There are 3 tanks from which water is drawn for irrigating paddy crop of *Kharif* season whenever rains fail. One diseal engine pump set is provided to one of the tanks. Since the tanks have limited supply of water in summer, second crop of paddy cannot be raised except in a few cents area. (ii) There is no good drainage in one of the *3* blocks. Drains have been opened.

D. *Soil type ann Soil analysis* :

(i) Broad soil type : Mostly sandy to sandy loam ; colour-brownish grey to light saffron ; depth – 15 cm. to 23 cm.

(ii) Chemical analysis :

| Sample No. | 724 | 725 | 726 | 727 | 728 | 729 | Optimum Nutrients-necessary in Kg/ha. |
|---|---|---|---|---|---|---|---|
| Identification | Block I upper portion | Block II lower portion | B. II | B. II | B. III upper portion | B. III lower portion | |
| Active Nitrage (Immediately available to plants). | Trace | Trace | Trace | Trace | 44·8 | Nil | 89·6 |
| Ammonia | Trace | Trace | Trace | Trace | Trace | Trace | 89·6 |
| Phosphorus | Trace | Trace | 2·2 | 2·2 | 2·2 | Trace | 22·2 |
| Potash | 26·9 | 26·9 | 35·9 | 26·9 | 26·9 | 26·9 | 89·6 |
| Calcium | 89·6 | 100·8 | 89·6 | 89.6 | 672 | 1120 | 89·6 |
| pH. | 5·9 | 5·9 | 6·0 | 5·9 | 6·0 | 5·9 | |
| Phosphorus. (Slowly available to plants). | | | | | | | |
| Reserve | 33·3 | 33·3 | 22·2 | 15·7 | 15·7 | 44·8 | |
| Potash | 44·8 | 44·8 | 44·8 | 26·9 | 44·8 | 44·8 | |

(pH. and Calcium seen to be optimum for normal growth).

(iii) Mechanical analysis : N.A.

E. *No. of Experiments* :

paddy—20 ; Total=20.

## 31. Agricultural Research Station, Raichur.

A. *General Information* :

(i) In Raichur taluka of Raichur distt., 3·2 Km. from Raichur R.S. with Lat.—16·12° N/Long.—77·4°E/Alt. 390 M. The farm area consists of two types of soils viz. red soil and black soil. The area is laid out into different square plots of convenient size, considering the slope of the land. All the plots are fairly levelled. (ii) Dry tract of Mysore state. (iii) Established in 1932. (iv) Major crops grown : *Rabi Jowar*, *Kharif*, *Jowar*, Cotton, Groundnut, Pigeon pea, Safflower etc. (v) Mainly dry farming research.

B. *Normal Rainfall* :

| Jan. | | Feb. | | March | | April | | May | | June | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| — | — | — | 0·1 | 1·9 | — | 2·6 | 0·2 | 1·6 | 1·2 | 3·2 | 7·3 |

| July | | Aug. | | Sept. | | Oct. | | Nov. | | Dec. | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | |
| 3·4 | 7·8 | 4·8 | 9·6 | 9·6 | 13·7 | 7·0 | 6·8 | 0·5 | 0·5 | 2·1 | — | 83·9 |

(Av. fortnightly rainfall in cm., based on the data for the period 1960-64).

C. *Irrigation and Drainage facilities* :

(i) (a) and (b) : Irrigated area is only about 1 ha. as compared to the total area of 60 ha. Very shortly irrigation facilities will be available for the areas. (ii) All the plots are provided with open drains.

D. *Soil type and soil analysis* :

(i) Broad soil types (a) Red soil ; (b) Black soil ; Depth—91 to 122 cm. ; Colour—Red ; (ii) Chemical analysis : (a) Red soil—Org. carbon 0·645% ; (b) Black soil—0·456%. (iii) Mechanical analysis : (a) Red soil—Coarse sand 59·34 ; Fine sand-30.00 ; Silt and clay—9·33 ; Black soil : Coarse sand—11·04 ; Fine sand 27·25 ; Silt and clay—56·31.

E. *No. of Experiments* :

*Jowar*—7, Groundnut—2 Mixed cropping—6 ; Total=15.

## 32. Minor Research Station, Ranisbennur.

A. *General Informotion* :

(i) In Ranisbennur Taluka of Dharwar district, 1·6 Km. from Ranisbennur R.S. with Lat.—14·37°N/Long—75·37°E/Alt.—592 M. The land is sloping towards East and North. (ii) Dry traet. (iii) Established in April, 1964. (iv) *Kharif* :—Cotton alone or mixed with G. Nut or G. Nut alone. *Jowar* mixed with Tur and Horse gram. *Rabi*:—*Jowar* alone and gram mixed. (v) Agronomic Research work Testing centre.

B. *Normal Rainfall* :

| Jan. | | Feb. | | March | | April | | May | | June | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| — | — | — | — | — | 4·9 | 29·8 | 19·9 | 48·8 | 51·9 | 5·5 | 36·0 |

| July | | Aug. | | Sept. | | Oct. | | Nov. | | Dec. | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | |
| 49·2 | 62·4 | 25·9 | 29·6 | 26·9 | 41·0 | 102·4 | 73·0 | 20·3 | 2·4 | 4·7 | 0·4 | 635·0 |

(Av. fortnightly rainfall in cm. based on the data for the period 1960-64).

C. *Irrigation and Drainage Facilities* :

(i) (a) and (b) Facilities are not available. (ii) No proper drainage system exists.

D. *Soil type and Soil analysis* :

(i) Broad soil type : N.A. (ii) Chemical analysis :

| Depth | pH. | N% | C% | CN (Ratio) | Organic matter | Total Sol. salt % | Av. N in Kg/ha. | Av. $P_2O_5$ in Kg/ha. |
|---|---|---|---|---|---|---|---|---|
| 0—23 cm. | 8·4 | 0·070 | 0·780 | 11·1 | 1·358 | 0·300 | 382·9 | 2·46 |
| 23—45 cm. | 8·4 | 0·056 | 0·838 | 14·9 | 1·459 | 0·125 | 484·4 | 2·46 |
| 45—61 cm. | 8·4 | 0·045 | 0·799 | 17·8 | 1·391 | 0·200 | 414·2 | 2·80 |

(iii) Mechanical analysis :

| Depth | Coarse sand | Fine sand | Silt | Clay |
|---|---|---|---|---|
| 0—23 cm. | 6% | 20% | 15·8% | 43·5% |
| 23—45 cm. | 6% | 20% | 14·7% | 35·5% |
| 45—61 cm. | 4% | 25% | 12·5% | 33·7% |

E. *No. of Experiments* :

Cotton—1 ; Total=1.

### 33. Agricultural Research Station, Sankeswar.

*A. General Information* :

(i) In Belgaum distt., nearest railway station, Ghataprabha. (ii) Lift irrigation tract of Belgaum distt. (iii) Establisaed in 1959. (iv) N.A. (v) Agronomic and manurial experiments as per technical Programme.

*B. Normal Rainfall* :

11·2 cm. (Av. from 1st July to 15 July).

*C. Irrigation and Drainage Facilities* :

(i) (a) Rain fed area. (b) Lift irrigation (about 2 ha.). (ii) Nil.

*D. Soil type and soil analysis* :

(i) Medium black and light red soil with 61 and 91 cm. depth. (ii) Chemical analysis ; pH.—8·0 to 8·3 ; Electrical Conductivity—0·25 to 0·69 mmhos/cm. ; Organic Carbon—0·34 to 0·44% ; Available $P_2O_5$-10·8 to 22·4 Kg/ha. ; Available $K_2O$-44·8 Kg/ha. (iii) Mechanical analysis : N.A.

*E. No. of Experiments* :

Sugarcane—5 ; Total=8.

### 34. Agricultural Research Station, Saundatti.

*A. General Information* :

(i) In saundatti Taluka of Belgam District, 54·4 Km. from Dharwar R.S. with Lat. 15·5° N/Long. 75·5° E/Alt.—N.A. Due to the formation of counter bunds, the topography is flat. (ii) It reppresents Dry tract. (iii) Established in 1947. (iv) (1) *Kharif* Jowar. (2) Groundnut. (3) Cotton (Laxmi) ; (4) Wheat ; (5) *Bajra* ; (6) Gram—Safflower ; (7) *Rabi* Jowar. (v) Agronomical.

*B. Normal Rainfall* :

| Jan. | | Feb. | | March | | Aprial | | May | | June | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| — | — | — | 0·1 | 0·3 | 0·9 | 4·7 | 2·0 | 3·8 | 6·6 | 1·6 | 3·3 |

| July | | Aug. | | Sept. | | Act. | | Nov. | | Dec. | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 72·5 |
| 7·1 | 4·3 | 4·6 | 5·0 | 5·0 | 7·4 | 9·4 | 4·3 | 0·9 | 0·4 | 0·7 | 0·1 | |

(Av. fortnightly rainfall in cm. based on the data for the period 1960-64).

*C. Irrigation and Drainage Facilities* :

(i) (a) and (b) : No irrigation facilities. (ii) No Proper drainage system exists.

*D. Soil type and Soil analysis* :

(i) Depth—1·52to 1·83 M. ; Colour—Black ; Structure—Clay loams. (iii) Chemical analysis : pH.—8·4 ; T.S.S.—126 PPM ; Org. Carbon—90·87 % ; N—0·038 % ; Av. $P_2O_5$ ; 0·004 % ; $K_2O$—0·014 % ; C.E.C. 63 63 M.E./100 gm. ; Exca. gm. ME/100 gm. ; Exng. 8·5 ME/100 gm. (iii) Mechanical analysis : (year of analysis 1966) Sand—20·5 % ; Silt—20·6 % ; Clay—50·7 %.

*E. No. of Experiments* :

Wheat—6, *Jowar*—25, Cotton—6, Groundnut—9 Rotational—4 ; Total=50.

### 35. Agricultural Research Station, Sirsi.

*A. General Information :*

(i) In Sirsi taluka of N. Kanara Distt., with Lat.—14° 35′ 13″ N/Long.—74° 21′ 26″ E/Alt.—550 to 600 M. above m.s.l. It is a low hilly vally area slopping towards last on one side and towards west on other side. (ii) Malanad tract. (iii) Established in 1961. (iv) Pepper is cultivated mixed with Areca by trailing pepper vines on each and every 7—8 years old Areca palms. Cardamom and Banana are also grown mixed along with the above crops, on small scale basis in almost all existing Areca gardens. (v) Varietal and Agronomic experiments on Pepper, Cardmom and Banana.

*B. Normal Rainfall :*

200 to 230 cm.

(Av. of 15 years, fortnightly rainfall data is not available).

*C. Irrigation and Drainage faeilities :*

(i) (a) and (b) No irrigation facilities. (ii) Natural drains opened in all over the lowleying area.

*D. Soil type and Soil analysis :*

(i) Broad soil types—Loamy to clayey soils with Depth—91 to 152 cm. of Colour Red. (ii) Chemical analysis and (iii) Mechanical analysis : N.A.

*E. No. of Experiments :*

Paddy—11 ; Total=11.

### 36. Agriculture Research Station, Siruguppa.

*A. General Information :*

(i) In Siruguppa taluka of Bellary distt, 37 Km. from Adoni (Andhra) and 58 Km. from Bellary (Mysore) with Lat.—15° 18′ N/Long—76° 54′ E/Alt.—381 M. Flat area of 46 Ha. situated at an elevation of 381 M. from the mean sea level. The experimental area is 2·4 Km. east of Siruguppa village and to the South of Adoni—Siruguppa Road at the 38 Km. stone. (ii) Peninsular zone of Deep black soils. (iii) Established in 1937, (iv) West lands : Paddy—paddy or Sugarcane ; Dry Cum Wet Land : *Jowar*—Cotton ; Navane—Cotton ; *Bajra*—Cotton *Jowar*—Wheat ; *Ragi*—*Jowar*. (v) Agronomic experiments on above crops.

*B Normal Rainfall :*

| Jan. | Feb. | March | April | May | June | July | Aug | Sept. | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| — | 0·7 | 1·1 | 2·9 | 6·4 | 8·4 | 15·0 | 13·9 | 15·4 | 8·9 | 1·6 | 0·9 | 75·2 |

(Av. monthly rainfall in cm. based on the data for the period 1960-64).

*C. Irrigation and Drainage Facilities :*

(i) (a) and (b) Yes, irrigation facilities are available since 1955. (ii) Moderate.

*D. Soil type and soil analysis*

(i) Broad soil type : Soils are deep and high in clay ; Depth—2·13 to 2·44 m. ; Colour—Deep black ; Structure—Fine clay with high water holding capacity and low permealsidity. (ii) Chemical analysis : pH.-1·8 ; Total Sol salts-0·67% ; Exch. Ca-19·3 Me% ; Exch. Mg. 10·70 Me% ; Organic Carbon-1·19% ; Available $P_2O_5$-3·0 Kg/ha. ; Available $K_2O$-45·2 Kg/ha. ; $CaCo_3$-13·3% ; Total N-0·027% ; C.EC.-54·7. (iii) Mechanical analysis : Coarse sand-9·97% ; Fine sand-11·4% ; Silt-12·9% ; Clay-49·8% .

*E. No. of Experiments :*

Paddy—13, Wheat—1, Jowar—15, Korra—2, Tur=2, Sugarcane—3, Cotton—28, Total=64.

## 37. Regional Arecanut Research Station, Thirthahally.

*A. General Information :*

(i) In Thirthahalli taluka of Shimoga distt. ; 64·4 Km. from Shimoga, with Lat.-13° 41′ 42″ N/Long.-75° 14′ 30″ E./Alt.-628 M. Experimental area is located in the narrow valley. The hills are covered with shurbs and bushes. At Kuruvalli Farm the experimental plot is laid on a table land by the side of river Tunga. (ii) Malnad tract. (iii) Established in Dec. 1952. (iv) Areca bulk garden and raising nursery seedlings. (v) Improving the yield and quality arecanut in this tract by : (a) Raising and distributing quality arecanut seedlings. (b) Evolving suitable manurial, cultural and irrigational schedules. (c) Evolving control measures against pests and diseases and (d) Investigating any other problems of importance to this region.

*B. Normal Rainfall :*

| Jan. | | Feb. | | March | | April | | May | | June | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| — | — | — | 0·3 | 0·2 | 0·4 | 1·2 | 1·5 | 2·6 | 12·2 | 10·3 | 26·1 |

| July | | Aug. | | Sept. | | Oct. | | Nov. | | Dec. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | Total |
| 63·1 | 37·1 | 54·6 | 30·4 | 7·4 | 9·5 | 8·6 | 8·2 | 2·8 | 0·7 | 2·0 | 0·3 | 279·5 |

(Av. fortnightly rainfall in cm. based on the data for period 1960-64).

*C. Irrigation and Drainage Facilities :*

(i) (a) At the head of the velley in which the garden is laid their is one tank which is the main source of irrigation at the Main farm. These facilities are available since the inception of farm. (b) By lift irrigation from the river Tunga at the Kuruvalli Farm. (ii) N.A.

*D. Soil type and soil analysis :*

(i) Broad soil types : Laterites and Latritic. Soil is deep with a laterite sub-stratum. Deep red to brown in colour. Soils highly leached poor in basc. Bite hard and gravelly. (ii) Chemical analysis and (iii) Mechanical analysis : N.A.

*E. No. of Experiments :*

Arecanut—20 ; Total = 20.

## 38. Central Cashewnut Research Station, Ullal.

*A. General Information :*

(i) In Mangalore taluka of South Kanara distt., 2·5 Km. from Ullal Rly. Stn. with Lat.-13° N/Long.-75° E/Alt.-14·7 m. The area is mostly undulating and sloping from South to North. (ii) High rainfall coastal region. (iii) Established in 1953. (iv) Cashew-entire. (v) It includes improvement of cashew crop through agronomical, botanical and horticultural investigations and survey of the different cashew growing tracts in the Mysore State to collect, identify and determine the different aspects of pests and diseases affecting cashew and to conduct trials to find out suitable remedial measures.

*B. Normal Rainfall :*

| Jan. | | Feb. | | March. | | April | | May | | June | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| — | 2·1 | — | 1·5 | 0·1 | 1·2 | 1·9 | 2·3 | 6·2 | 34·0 | 35·9 | 33·9 |

| July | | Aug. | | Sept. | | Oct. | | Nov. | | Dec. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | Total |
| 49·3 | 55·4 | 51·4 | 31·9 | 22·4 | 30·4 | 9·8 | 19·3 | 2·9 | 1·1 | 1·9 | 5·9 | 400·8 |

(Av. fortnightly rainfall in cm. based on data for the period 1960-64).

*C. Irrigation and Drainage Facilities* :

(i) (a) and (b) No irrigation facilities. (ii) Yes, proper drainage system exists.

*D. Soil type and soil analysis* :

(i) Broad soil types : Depth—30 to 60 cm. ; Colour—Red brown ; Structure—Porous.

(ii) Chemical analysis : Year in which analysis was done-1964.

| | pH. | Total soluble salt in E.C. mm hos/cm. | Organic carbon in percent | Available Phosphorus Kg/ha. | Available Potash Kg/ha. |
|---|---|---|---|---|---|
| Top soil 10 cm. | 6·07 | 0·51 CGI | 0·94 | 2·0 | 93·4 |
| Sub. soil 10 cm. | 6·15 | 0·16 CGI | 0·74 | 1·7 | 90·7 |

(iii) Mechanical analysis : N.A.

*E. No. of Experiments* :

Cashewnut—13 ; Total=13.

## 39. Arecanut Research Station, Vittal.

*A. General Information* :

(i) In South Kanara district nearest Rly. Stn. Mangalore with Lat 12·25°N/Long 75.42E/Alt. 200 m. The experimental area is on terraces and level fields made at the foot of hillocks. (ii) It represents—Semi Malnad tract. (iii) Established in—1956. (iv) Arecanut, Cashew & Cacao. (v) Fundamental and applied Research on Arecanut and applied Research on Cashew and Cacao.

*B. Normal Rainfall* :

| Jan. | | Feb. | | March | | April | | May | | June | | July | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| 0·1 | — | — | — | — | — | 1·2 | 3:4 | 3.1 | 11·5 | 34·7 | 60·3 | 70·0 | 80·4 |

| Aug. | | Sept. | | Oct. | | Nov. | | Dec. | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | Total |
| 47·3 | 30·6 | 18·7 | 16·4 | 8·6 | 5·9 | 6·1 | 4·7 | 0·4 | 0·2 | 402·6 |

(Av. fortnightly rainfall in cm. based on the data for the period 1967-71).

*C. Irrigation and Drainage Facilities* :

(i) (a) Yes, Since 1956. (b) A river is flowing through the Farm ; water is pumped from it for irrigation purpose. (ii) Yes, proper drainage system.

*D. Soil type and Soil analysis* :

(i) Broad soil type-Laterite deep upto 2 m ; Red or Brown structure in colour. Laterite mixed with sand alluvium & gravel. (ii) Chemical analysis (Year of analysis 1959) pH. 5·1 to 6·1 Total N%=0·02 to 0·06 ; Total $P_2O_5$%0·021 to 0·06 ; Total $K_2O$% 0·01 to 0·04 ; Org. carbon=0·22 to 1·05. (iii) Mechanical analysis (Year of analysis 1966) Loss on solution=0·77% ; Clay=38·32% : Silt=9·56% ; Sand=51·21%.

*E. No. of Experiments.*

Arecanut—1 ; Total=1.

# EXPERIMENTAL DATA

**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 60(122), 61(98).**

**Site :- Agri. Res. Stn., Dhadesaugar.** **Type :- 'M'.**

Object :—To compare the performance of bulky organic manures and artificial fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) 7 to 9.7.60 ; 1st week of July, 1961. (iv) (a) Ploughing and puddling. (b) Transplanting. (c) Nil. (d) 20 cm. × 20 cm. (e) 2 to 3. (v) Nil. (vi) H.R. 19 (early). (vii) Irrigated. (viii) 3 to 4 weedings with Japaneese weeder. (ix) 51 cm. ; 43 cm. (x) 14 to 17.10.1960 ; 1st week of Oct., 1961.

2. TREATMENTS :

All combinations of (1) and (2)+2 extra treatments.

(1) 4 sources of 56 Kg/ha. of N : $S_1$=G.M, $S_2$=F.Y.M. $S_3$=G.N. C and $S_4$=A/S.

(2) 2 levels of $P_2O_5$: $P_0$=0 and $P_1$=28 Kg/ha.

$E_0$=Control (2 plots) and $E_1$=28 Kg/ha. of $P_2O_5$ (2 plots).

3. DESIGN :

(i) Fact, in R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) (a) and (b) 10·1 m. × 8.5 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Leaf top drying and stem borer attack were noticed. Spraying with folidol. (iii) Yield of grain. (iv) (a) 1960—1961. (b) No. (c) Results of combined analysis given under 5. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

5. RESULTS :

(i) 2394 Kg/ha. (ii) 128·5 Kg/ha. [based on 31 d. f. made up of pooled error and Treatments × years interaction]. (iii) Main effects of S and interaction P × S are highly significant. (iv) Av. yield of grain in Kg/ha.

$E_0$=1214 Kg/ha. and $E_1$=1610 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $P_0$ | 3137 | 1866 | 2087 | 3094 | 2726 |
| $P_1$ | 3250 | 1948 | 2972 | 2761 | 2733 |
| Mean | 3193 | 1907 | 2889 | 2927 | 2729 |

C.D. for S marginal means =131·2 Kg/ha.

C.D. for the body of P × S table=185·5 Kg/ha.

| Years | $P_0$ | $P_1$ | Sig. | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 2877 | 2877 | N.S. | 3468 | 1859 | 2952 | 3227 | ** | 2877 | 397·0 |
| 1961 | 2576 | 2589 | N.S. | 2919 | 1955 | 2827 | 2628 | N.S. | 2582 | 470·0 |
| Pooled | 2726 | 2733 | N.S. | 3193 | 1907 | 2889 | 2927 | ** | 2729 | 128·5 |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 60(132), 61(111), 62(113), 63(52).**

**Site :- Agri. College Farm, Dharwar.** **Type :. 'M'.**

Object :—To find out the suitable methods of application of N and P fertilizers for drilled Paddy.

## 1. BASAL CONDITIONS :

(i) (a) Paddy — Paddy. (b) Paddy. (c) N.A. (ii) Alluvial soil for 60(132) and greyish clay loam for 61, 62 and 63. (iii) 24, 25.5.1960 ; 5.6.1961 ; 1.6.1962 ; 29.5.63. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) N.A. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) A—200 (late). (vii) Unirrigated. (viii) Weedings for 60 (132) and 63 (52) and weeding+Interculturing for 61 (111) and 62 (113). (ix) 53 cm. ; N.A. for 61, 62 and 63. (x) 29.11.1960 ; 28.11.61 ; 22.11.62 ; 26/27.11.1963.

## 2. TREATMENTS :

All the combinations of (1) and (2)+a control.

(1) 2 levels of fertilisers : $L_1$=33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super and $L_2$=50·4 Kg/ha. of N as A/S+33·6 Kg/ha. of $P_2O_5$ as Super.

(2) 6 methods of placement of fertilisers : $M_1$=Broadcast before sowing, $M_2$=Drilling both ways before sowing, $M_3$=Placing 4 cm. deeper than seed $M_4$= Application by seed cum fertilisers drill in the same line, $M_5$=5 cm. away and 5 cm. deep from the seed line and $M_6$ =Inserting pellets made out of fertilisers and mud every 30 cm. apart along the crop line at thinning.

## 3. DESIGN :

(i) Fact in R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×6·1 m. (b) 6·1 m.×4·6 m. for 60 ; 7·6 m.×4.8 m. for 61, 62 and 63. (v) 1·5 m.×1·5 m. for 60 (132) and 76 cm.×65 cm. for 61, 62 and 63. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960—1963. (b) No. (c) Results of combined analysis given under 5. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is present.

## 5. RESULTS :

(i) 3006 Kg/ha. (ii) 626·7 Kg/ha. (based on 36 d.f. made up of Treatments×years interaction). (iii) Control vs. others is highly significant. (iv) Av. yield of grain in Kg/ha.

Control=2449 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | Mean |
|---|---|---|---|---|---|---|---|
| $L_1$ | 2847 | 2933 | 2918 | 3121 | 3096 | 3014 | 2988 |
| $L_2$ | 2897 | 3122 | 3095 | 3204 | 3108 | 3270 | 3116 |
| Mean | 2872 | 3028 | 3006 | 3162 | 3102 | 3142 | 3052 |

C.D. for control vs. others=331·0 Kg/ha.

| Years | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | Sig. |
|---|---|---|---|---|---|---|---|
| 1961 | 2969 | 3774 | 3300 | 3541 | 3799 | 3390 | * |
| 1962 | 2923 | 2905 | 3211 | 3558 | 2856 | 2856 | * |
| 1963 | 3006 | 3010 | 2930 | 2983 | 3154 | 3475 | N.S. |
| 1964 | 2590 | 2423 | 2586 | 2568 | 2597 | 2846 | N.S. |
| Pooled | 2872 | 3028 | 3006 | 3162 | 3102 | 3142 | N.S. |

| $L_1$ | $L_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|
| 3329 | 3596 | N.S. | 3419 | 616·8 |
| 3121 | 2982 | N.S. | 3032 | 490·1 |
| 2926 | 3260 | ** | 3030 | 371·6 |
| 2577 | 2626 | N.S. | 2542 | 273·0 |
| 2988 | 3116 | N.S. | 3006 | 626·7 |

**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 64(85).**

**Site :- Agri. College Farm, Dharwar.** **Type :- 'M'.**

Object :—To find out suitable method and kind of fertilizer for application to drilled Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) Nil. (ii) Alluvial. (iii) 10.6.64. (iv) (a) Ploughing, clad crushing, 9 weedding and harrowing. (b) Drilling. (c) 67 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) 9·8 C.L./ha. of F.Y.M. (vi) A-200 (late). (vii) Unirrigated. (viii) Weeding. (ix) 86 cm. (x) 25.11.69.

2. TREATMENTS :

All combinations of (1) and (2) with 32·1 Kg/ha. of $P_2O_5$ as super and a control.

(1) 4 sources of 44·5 Kg/ha. of N : $S_1$=A/S, $S_2$=Urea, $S_3$=C/A/N and $S_4$=A/S/N.

(2) 4 methods of placement of fertilizers: $M_1$=Full dose 13 cm. deep by plough sole a week before sowing, $M_2=\frac{1}{2}$ (N+P) by seed cum fertilizer drill in the same time where the seed is sown and $\frac{1}{2}$ (N+P) by broadcasting between the times 5 weeks after sowing, $M_3=\frac{1}{2}$ (N+P) pallets prepared out of mud and fertilizers every 30 cm. apart along one side at sowing+$\frac{1}{2}$ (N+P) 5 cm. away and 5cm. deep from the crop line 5 weeks after sowing and $M_4$= Full dose applied with seed cum fertilizer drill at sowing.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 17. (b) N.A. (iii) 4. (iv) 9·1 m.×4·9 m. (b) 7·6 m.×4·3 m. (v) 76 cm.× 30 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1964-N.A. (b) No (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1989 Kg/ha. (ii) 115 5 Kg/ha. (iii) Main effects of M and interaction M×S are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $S_1$ | 2089 | 1933 | 2536 | 2297 | 2214 |
| $S_2$ | 1665 | 2113 | 2646 | 1662 | 2022 |
| $S_3$ | 1903 | 1998 | 1997 | 1690 | 1897 |
| $S_4$ | 1437 | 2031 | 1972 | 2243 | 1921 |
| Mean | 1774 | 2019 | 2288 | 1973 | 2014 |

C.D. for M marginal means=82·2 Kg/ha.
C.D. for body of table =164·4 Kg/ha.

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 62(54).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'M'.**

Object :—To compose the effect of Nitrophosphate processed by O.D.D.A. and P.E.C. method with Super at different levels of N on the growth and yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Clay Loam. (iii) 10.8.60. (iv) (a) 3 ploughings and puddling. (b) Transplanting. (c) 34 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) Nil. (vi) S-317 Paddy. (vii) Irrigated. (viii) 2 weedings. (ix) 65 cm. (x) 16.11.62.

2. TREATMENTS :

All combinations of (1), (2) and (3)+4 extra treatments.

(1) 3 sources of fertilizers : $S_1$=Super and A/S, $S_2$=Nitrophos. processed by O.D.D.A. and $S_3$=Nitrophos. processed by P.E.C.

(2) 3 levels of fertilizers : $L_1$=13·4 Kg/ha. of N+118 Kg/ha. of $P_2O_5$, $L_2$=2 $L_1$ and $L_3$=4 $L_1$

(3) 3 methods of placements of fertilizers : $M_1$=Broadcast, $M_2$=6 cm. between the soil and $M_3$=By pallet method.

$T_0$=Control, $T_1$=13·4 Kg/ha. of N, $T_2$=26·9 Kg/ha. of N and $T_3$=53·9 Kg/ha. of N as A/S.

3. DESIGN :

(i) $3^3$ confd.+4 extra treatments in each block. (ii) (a) 13 Plots/block, 3 blocks/replication. (b) 9·1 m.× 35·7 m. (iii) 2. (iv) (a) 9·1 m.×2·7 m. (b) 8·7 m.×2·3 m. (v) 23 cm.×23 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) N.A. (v) Margalox and Nagenahally. (vi) and (vii) Nil.

5. RESULTS :

(i) 2912 Kg/ha. (ii) 432·4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $L_1$ | $L_2$ | $L_3$ | $M_1$ | $M_2$ | $M_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $S_1$ | 2724 | 2924 | 2724 | 2543 | 3024 | 2805 | 2791 |
| $S_2$ | 2655 | 2857 | 3243 | 2681 | 3197 | 2877 | 2918 |
| $S_3$ | 2993 | 2774 | 3430 | 3343 | 2931 | 2943 | 3066 |
| Mean | 2791 | 2852 | 3131 | 2856 | 3051 | 2875 | 2925 |
| $M_1$ | 2412 | 2950 | 3205 | | | | |
| $M_2$ | 3152 | 2898 | 3102 | | | | |
| $M_3$ | 2808 | 2707 | 3090 | | | | |

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**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 62(55).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'M'.**

Object :—To study the effect of forsed Mg. phos. on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Clay loam. (iii) 10.8.62. (iv) (a) 3 ploughings. (b) Transplanting. (c) 34 Kg/ha. (d) 25 cm.×15 cm. (e) 2. (v) 33·6 Kg/ha. of N. (vi) China-2. (vii) Irrigated. (viii) 2 weedings. (ix) 65 cm. (x) 16.11.62.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 2 sources of $P_2O_5$ : $S_1$=Super and $S_2$=Mg. phos.

(2) 2 levels of $P_2O_5$ : $P_1$=33·6 and $P_2$=50·4 Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 9·1 m.×7·6 m. (b) 8·7 m.×7·2 m. (v) 23 cm. ×23 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 3581 Kg/ha. (ii) 523·9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=3431 Kg/ha.

| | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $P_1$ | 3738 | 3495 | 3616 |
| $P_2$ | 3596 | 3648 | 3622 |
| Mean | 3666 | 3572 | 3619 |

**Crop :- Paddy** ***(Kharif)*****.** **Ref :- Ms. 61(59).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'M'.**

Object : - To find out the optimum combination of N, P and K for Paddy on long duration variety S. 661.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) As per treatments. (ii) Clay loam. (iii) 26.6.61, 2.8.61. (iv) (a) 3 ploughings and puddling. (d) Transplanting. (c) 45 Kg/ha. (d) 23 cm.×15 cm. (e) 2 to 3. (v) Sesbania at 494·2 Kg/ha.+50·2 Q/ha. of compost. (vi) S. 661 (long duration). (vii) Irrigated. (viii) 2 rotary weedings and 3 hand weedings. (ix) 84 cm. (x) 18.12.61.

2. TREATMENTS :

All combinations of (1), (2) and (3).

(i) 3 levels of N as A/S : $N_0=0$. $N_1=33·6$ and $N_2=67·2$ Kg/ha.

(2) 3 levels of $P_2O_5$ as Super : $P_0=0$, $P_1=33·6$ and $P_2=67·2$ Kg/ha.

(3) 3 levels of $K_2O$ as Mur. Pot. : $K_0=0$, $K_1=33·6$ and $K_2=67·2$ Kg/ha.

½ dose of N, all P and K applied as transplanting, the other ½ dose of N is applied at first hand weeding.

3. DESIGN :

(i) Fact, in R.B.D. (ii) (a) 27. (b) 41·1 m.×38·4 m. (iii) 2. (iv) (a) 14·6 m.×4·1 m. (b) 14·2 m.×3·7 m. (v) 23 cm.×23 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain weight. (iv) (a) 1959 to 1961. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Date for 1960 is N.A. at the Res. Stn. ;

5. RESULTS :

(i) 3959 Kg/ha. (ii) 330·8 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 3412 | 3456 | 3480 | 3332 | 3336 | 3680 | 3449 |
| $N_1$ | 4069 | 3912 | 4065 | 3816 | 4102 | 4128 | 4015 |
| $N_2$ | 4138 | 4510 | 4590 | 4452 | 4345 | 4441 | 4413 |
| Mean | 3873 | 3959 | 4045 | 3867 | 3928 | 4083 | 3959 |
| $K_0$ | 3960 | 3881 | 3759 | | | | |
| $K_1$ | 3789 | 3839 | 4155 | | | | |
| $K_2$ | 3870 | 4158 | 4221 | | | | |

C.D. for N marginal means=226·7 Kg/ha.

**Crop :- Paddy** (*Rabi*). **Ref :- Ms. 61(62).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'M'.**

Object :—To find the optimum combination of N, P and K for Paddy on wet lands for medium duration variety S. 317.

1. BASAL CONDITIONS :

(i) Paddy after Paddy. (b) Paddy. (c) 75·3 Q/ha. of compost. (ii) Clay loam. (iii) 4·2·61. (iv) (a) 3 ploughings. (b) Transplanting. (c) 45 Kg/ha. (d) 30 cm.×23 cm. (e) 1. (v) 5604 Kg/ha. of G.L.+ 75·3 Q/ha. of compost. (vi) S. 317 (medium). (vii) Irrigated. (viii) 2 intercultivation. (ix) 204 cm. (x) 20.5.61.

2. TREATMENTS :

Same as in expt. no. 61 (59) on page 5.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 27. (b) 37·5 m.×14·6 m. (iii) 2. (iv) (a) 14·6 m.×4·2 m. (b) 14·3 m.×3·9 m. (v) 15 cm.×15 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958 to 1961. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Date for 1960 in N.A. at the Res. Stn. ;

5. RESULTS :

(i) 3981 Kg/ha. (ii) 489·6 Kg/ha. (iii) Main effects of N, P and interaction N×P are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $P_0$ | 3632 | 3665 | 4549 | 4149 | 3562 | 4135 | 3949 |
| $P_1$ | 3531 | 4036 | 3369 | 3764 | 3598 | 3574 | 3645 |
| $P_2$ | 3492 | 4299 | 5261 | 4520 | 4229 | 4303 | 4350 |
| Mean | 3552 | 4000 | 4393 | 4144 | 3796 | 4004 | 3981 |
| $K_0$ | 3676 | 4121 | 4636 | | | | |
| $K_1$ | 3385 | 3710 | 4294 | | | | |
| $K_2$ | 3594 | 4160 | 4249 | | | | |

C.D. for N or P marginal means=335·5 Kg/ha.
C.D. for body of N×P table =581·1 Kg/ha.

**Crop :- Paddy** (*Rabi*). **Ref :- Ms. 61(61).**

**Site :- Agri. Res. Stn. Hebbal.** **Type :- 'M'.**

Object :—To find out the best Nitrogeneous fertilizers for *Rabi* Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Clay loam. (iii) 4.1.61/17.2.61. (iv) (a) 3 ploughings. (b) Transplanting. (c) 45 Kg/ha. (d) 25 cm.×15 cm. (e) 3. (v) 224·2 Kg/ha. of Super applied before transplanting. (vi) S. 705. (vii) Irrigated. (viii) 2 interculturings. (ix) 20 cm. (x) 3.6.61.

2. TREATMENTS :

5 sources of 33·6 Kg/ha. of N : $S_1$=A/S, $S_2$=C/A/N, $S_3$=A/S/N, $S_4$=A/C and $S_5$=Urea.
Fertilizers applied in two equal doses at planting and one month after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 41·2 m.×9·2 m, (iii) 4. (iv) (a) and (b) 9·1 m.×8·2 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair, (ii) Nil. (iii) Yield of grain. (iv) (a) 1958-1961. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Data for 1960 is N.A. at the Res. Stn.

5. RESULTS :

(i) 3071 Kg/ha. (ii) 278·7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ |
|---|---|---|---|---|---|
| Av. yield | 3127 | 3061 | 2848 | 3072 | 3245 |

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**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 61(58).**

**Site :- Agri. Rea. Stn. Hebbal.** **Type :- 'M'.**

Object :—To find out the suitable Nitrogenous fertilizer for Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy after Paddy. (b) Paddy. (c) 33·6 Kg/ha. of N. (ii) Clay loam. (iii) 20.6.61/21.7.61. (iv) (a) 3 ploughings and puddling. (b) Transplanted. (c) 45 Kg/ ha. (d) 23 cm.×15 cm. (e) 2 to 3. (v) 224·2 Kg/ha. of Super. (vi) S. 1092 (Long duration). (vii) Irrigated. (viii) Gap filling and 3 weedings. (ix) 84 cm. (x) 26-12-61.

2. TREATMENTS :

Same as expt. no. 61 (61) on page 7.

3. DESIGN :

(i) Latin square. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 10·1 ×8·1 m. (b) 9·6 m.×7·6 m. (v) 23 cm.× 23 cm. (vi) Yes.

4. GENERAL :

(i) Fair- (ii) Nil. (iii) Wt. of grain yield. (iv) (a) 1959 to 1961. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Data. for 1960 is N.A. at the Res. Stn.

5. RESULTS :

(i) 4013 Kg/ha. (ii) 282·8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ |
|---|---|---|---|---|---|
| Av. yield | 4084 | 3861 | 4311 | 3914 | 3894 |

**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 65(52).**

**Site :- Agri. Res. Stn., Hiriyur.** **Type :- 'M'.**

Object :—To determine the effect of micronutrients application and to study the relatives merits of the two methods of application in soil and foliar application.

1. BASAL CONDITIONS :

(i) (a) S. Cane-Paddy-Hybrid Maize. (b) Hybrid Maize. (c) F.Y.M. at 24.7 Kg/ha., 89·6 Kg/ha. of N+ 44·8. Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$ (ii) Redloam. (iii) 10.8.65. (iv) (a) 3 ploughing, one harrowing. (c) 49 Kg/ha. (d) 23 cm. × 15 cm. (e) 3. (v) 24·7 C.L./ha. of F.Y.M. (vi) S-317 (medium). (vii) Irrigated. (viii) Passed Japanese weedes twice 2 hand weedings. (ix) 17 cm. (x) 29.11.65.

2. TREATMENTS:

16 manurial treatments : $T_0$=Control, $T_1$=Water spray, $T_2$=33·6 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$,+ 33·6 Kg/ha. of $K_2O$, $T_3$=$T_2$+56·0 Kg/ha. of Mn. Sul., $T_4$=$T_2$+28·0 Kg/ha. of Zn. Sul., $T_5$=$T_2$+28 0 K/ha. of Cu. Sul., $T_6$=$T_2$+Borax at 16·8 Kg/ha., $T_7$= $T_2$+Sodium Molybdate at 1.1 Kg/ha., $T_3$=$T_2$+Mn. Sul.+Zn. Sul.+Cu. Sul.+ Borax+Sodium Molybdate in the above proportions, $T_9$=$T_2$+water spray, $T_{10}$ =$T_2$+Mn. Sul. spray at 16·8 Kg/ha., $T_{11}$= $T_2$+Zn. Sul. spray at 11·2 Kg/ha., $T_{12}$=$T_2$+Cu. Sul. Spray at 11·2 Kg/ha., $T_{13}$=$T_2$+Borax spray at 5·6 Kg/ha., $T_{14}$=$T_2$+Sodium Moly bdate spray at 0·6 Kg/ha. and $T_{15}$=$T_2$+Mn. Sul.+Zn. Sul.+Cu. Sul.+Borax+Sodium Molybdate sprayed in the above proportions.

$T_9$ to $T_8$ applied to the soil.

3. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) 80·5 m. × 10·1 m. (iii) 3. (iv) (a) 10·1 m. × 5·0 m. (b) 9·1 m. × 4·1 m. (v) 3 rows. (vi) Yes.

4. GENERAL :

(i) Lodged. (ii) Stem borer and leaf spot. wettable Sulpher and Folidol sprayed. (vi) Grain yield. (iv) (a) to (c) No. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2522 Kg/ha. (ii) 826·5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 2348 | 2038 | 2835 | 2879 | 2436 | 2436 | 2259 | 2790 |

| Treatment | $T_8$ | $T_9$ | $T_{10}$ | $T_{11}$ | $T_{12}$ | $T_{13}$ | $T_{14}$ | $T_{15}$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 2259 | 2879 | 2436 | 2082 | 2392 | 2436 | 3278 | 2569 |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 65(53).**

**Site :- Agri. Res. Stn., Hiriyur.** **Type :- 'M'.**

Object :— To fix up a optimum dose of N, P and K for Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 67·2 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+33·6 Kg/ha. of $K_2O$. (ii) Red loam. (iii) 27.6.65. (iv) (a) 3 ploughings 2 harrowings. (b) Line planting. (c) 49 Kg/ha. (d) 23 cm. × 15 cm. (e) N.A. (v) 24·7 Kg/ha. of F.Y.M. (vi) S—661 (late). (vii) Irrigated. (viii) Passed Japanese weeder once 2 hand weedings. (ix) 18 cm. (x) 11.12.65.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N : $N_1=33{\cdot}6$, $N_2=67{\cdot}2$ and $N_3=100{\cdot}8$ Kg/ha.
(2) 3 levels of $P_2O_5$: $P_0=0$, $P_1=33{\cdot}6$ and $P_2=67{\cdot}2$ Kg/ha.
(3) 3 levels of $K_2O$ : $K_0=0$, $K_1=33{\cdot}6$ and $K_2=67{\cdot}2$ Kg/ha.

3. DESIGN :

(i) $3^3$ coufd. (ii) 9 plots/block ; 3 blocks/replication. (b) 90·5 cm.×15·1 cm. (iii) 2. (iv) (a) 10·1 m.× 5·0 cm. (b) 9·1 m.×4·1 m. (v) 4 rows. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Stem borer—endrin sprayed. (iii) Yield of grain. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 4410 Kg/ha. (ii) 843·8 Kg/ha. (iii) Main effect of N is significant. P effect is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 3451 | 4214 | 4334 | 3655 | 4259 | 4086 | 4000 |
| $N_2$ | 3709 | 4893 | 4694 | 4183 | 4631 | 4481 | 4432 |
| $N_3$ | 3957 | 4911 | 5528 | 4942 | 4534 | 4920 | 4799 |
| Mean | 3706 | 4673 | 4852 | 4260 | 4475 | 4495 | 4410 |
| $K_0$ | 3518 | 4889 | 4374 | | | | |
| $K_1$ | 3762 | 4241 | 5421 | | | | |
| $K_2$ | 3837 | 4889 | 4760 | | | | |

C.D. for N or P marginal means=533·9 Kg/ha.

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**Crop :- Paddy (*Rabi*).** **Ref :- Ms. 65(49).**

**Site :- Agri. Res. Stn , Hiriyar.** **Type :- 'M'.**

Object : – To find out the performance of different fertilizers in split doses with different levels of N.

1. BASAL CONDITIONS :

(i) (a) Paddy-Sugarcane. (b) Hybrid Maize. (c) 89 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$ (ii) Red loam. (iii) 10.8.65. (iv) (a) 3 ploughings, 1 cultivator and 1 harrowing. (b) Line transplanting. (c) 49 Kg/ha. (d) 23 cm.×15 cm. (e) 3. (v) 24·7 C.L./ha. of F.Y.M. (vi) S-317 (medium duration). (vii) Irrigated. (viii) Twice Passing Japanese weeder 2 hand weedings. (ix) 18 cm. (x) 27.11.65.

2. TREATMENTS :

**Main-plot treatments :**

3 levels of N : $N_1=33{\cdot}6$, $N_2=67{\cdot}2$ and $N_3=100.8$ Kg/ha.

**Sub-plot treatments :**

6 sources of N : $S_1$=C/A/N, $S_2$=A/S/N, $S_3$=Urea, $S_4$=Sodium Nitrate, $S_5$=A/C and $S_6$=A/S.

**Sub-sub-plot treatments :**

2 lines of application : $T_1$=Full dose at planting and $T_2$=Half at planting+half at tillering.

3. DESIGN :

(i) Split-split plot. (ii) (a) 3 main-plots/replication ; 6 sub-plots/main-plot, 2 sub-sub-plots/sub-plot. (b) 120·7 m. × 13·7 m. (iii) 2. (iv) (a) 10·1 m. × 4·6 m. (b) 9·1 m. × 3·7 m. (v) 4 rows. (vi) Yes.

4. GENERAL :

(i) Lodged. (ii) Stem borer and leaf spot, sprayed with wettable sulphur and Folidol. (iii) Grain and fodder yield. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 3299 Kg/ha. (ii) (a) 3550·8 Kg/ha. (b) 747·0 Kg/ha. (c) 590·3 Kg/ha. (iii) Main effect of Tis highly significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | $T_1$ | $T_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $N_1$ | 3049 | 2974 | 3348 | 2698 | 2511 | 3094 | 2581 | 3311 | 2946 |
| $N_2$ | 2511 | 3781 | 3221 | 2922 | 3923 | 3049 | 3054 | 3415 | 3235 |
| $N_3$ | 3527 | 3834 | 3692 | 3632 | 3886 | 3729 | 3336 | 4098 | 3717 |
| Mean | 3029 | 3530 | 3420 | 3084 | 3440 | 3291 | 2990 | 3608 | 3299 |
| $T_1$ | 2939 | 3149 | 3104 | 2934 | 3109 | 2705 | | | |
| $T_2$ | 3119 | 3911 | 3737 | 3234 | 3771 | 3876 | | | |

C.D. for T marginal means = 292·3 Kg/ha.

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**Crop :- Paddy** (*First crop*). **Ref :- Ms. 60(58), 61(36).**

**Site :- Paddy Breeding Stn., Mangalor.** **Type :- 'M'.**

Object :— To find out the efficiency of different nitrogeneous fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy, G.M. (b) G.M. (c) Nil. (ii) Laterite, loamy. (iii) 20.6.60 ; 21.6.61. (iv) (a) 4 to 6 ploughings. (b) Transplanting. (c) N.A. ; 18 Kg/ha. (d) 20 cm. × 20 cm. ; 25 cm. × 20 cm. (e) 3 to 4. (v) G M. at 5600 Kg/ha. + 33·6 Kg/ha. of N as A/S + 33·6 Kg/ha. of $P_2O_5$ as Super + 33·6 Kg/ha. of $K_2O$ as Mur. Pot. for 60(58) G.L. at 1345 Kg/ha. + 34 Kg/ha. of $P_2O_5$ as Super + 27·3 Kg/ha. of $K_2O$ as Mur. Pot. for 61(36). (v) M.G.L. 5 (medium). (vii) Unirrigated. (viii) 1 weeding. (ix) 181 cm. ; 547 cm. (x) 14.10.60 ; 26.9.61.

2. TREATMENTS :

7 sources of 33·6 Kg/ha. of N : $S_0$ = Control (No N), $S_1$ = A/S, $S_2$ = C/A/N, $S_3$ = A/C, $S_4$ = Urea, $S_5$ = A/C/N $S_6$ = C/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) 53·3 m. × 7·6 m. (iii) 4. (iv) (a) 7·6 m. × 7·6 m. (b) 7·4 m. × 7·4 m. (v) 10 cm. × 10 cm. (vi) Yes.

4. GENERAL :

(i) Fair ; good. (ii) Attack of helminthosporium ; Mild attack of gallfly and Helminthosporuim. (iii) Grain yield. (iv) (a) 1956 to 1961. (b) No. (c) Nil. (v) and (vi) Nil. (vii) As the error variances are heterogeneous and Treatments × years interaction is absent, results of the individual experiments are presented below.

5. RESULTS :

**60(58)**

(i) 2576 Kg/ha. (ii) 152·7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 2691 | 2550 | 2617 | 2582 | 2597 | 2612 | 2386 |

**61(36)**

(i) 2648 Kg/ha. (ii) 122·8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 2656 | 2691 | 2580 | 2617 | 2617 | 2646 | 2726 |

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**Crop :- Paddy (*1st crop*).** **Ref :- Ms. 63(10), 64(2), 65(29).**

**Site :- Paddy Breeding Stn., Mangalor.** **Type :- 'M'.**

Object :— To compare the efficiency of niterogeneous fertilizers in single crop land on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) Nil. (ii) Laterite loamy in texture. (iii) 25.5.63/6.7.63 ; 13.7.64/12.6.64 ; 9.6.65/22.7.65. (iv) (a) 5 to 6 ploughings, puddling and levelling. (b) Transplanting. (c) 18 Kg/ha. for 63(10) and 64(2) and 37 Kg/ha. for 65(29). (d) 25 cm.×23 cm. ; 25 cm.×20 cm. ; 20 cm.×20 cm. (e) 3. (v) G.L. at 79 Q/ha.+34 Kg/ha. of $P_2O_5$ as Super+27·3 Kg/ha. of $K_2O$ as Mur. Pot. for 63(10) and 64(2) ; N.A. (vi) M.G.L. 2 (medium). (vii) Unirrigated. (viii) Nil ; Hand weeding. (ix) 264 cm ; 234 cm. ; 228 cm. (x) 9.10.62 ; 20.10.64 ; 10.10.65.

2. TREATMENTS :

7 manurial treatments : $T_0$=Control, $T_1$=37·1 Kg/ha. of N as A/S, $T_2$=74·1 Kg/ha. of N as A/ S, $T_3$=37·1 Kg/ha. of N as Urea, $T_4$=74·1 Kg/ha. of N as Urea, $T_5$=37·1 Kg/ha. of N as C/A/N and $T_6$=74·1 Kg/ha. of N as C/A/N.

3. DESIGN :

(i) R.B,D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×7·9 m. (b) 8·9 m.×7·7 m. ; 8·7 m.×7·5 m. ; 9·1 m.×7·9 m. (v) 10 cm.×10 cm. ; 20 cm.×20 cm. ; Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963 to 65. (b) Yes. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments× years interaction is absent.

5. RESULTS :

(i) 2926 Kg/ha. (ii) 272·5 Kg/ha. (based on 66 d.f. made up of pooled error and Treatments×years interaction. (iii) Treatment differences are highly significant. (iv)iAv. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 2618 | 3032 | 2947 | 2780 | 3104 | 2919 | 3079 |

C.D.=222·2 Kg/ha.

| Years | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_9$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1963 | 2763 | 2948 | 2832 | 2810 | 2911 | 2886 | 2962 | N.S. | 2874 | 237·5 |
| 1964 | 3249 | 3832 | 3665 | 3528 | 3790 | 3631 | 3764 | * | 3636 | 365·3 |
| 1965 | 1841 | 2318 | 2343 | 2001 | 2611 | 2241 | 2510 | ** | 2267 | 215·3 |
| Pooled | 2618 | 3032 | 2947 | 2780 | 3104 | 2919 | 3079 | ** | 2926 | 272·5 |

**Crop :- Paddy.** **Ref :- Ms. 60(68), 61(40), 62(29).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'M'.**

Object :—To compare the efficiency of Mg. phos. with super.

1. BASAL CONDITIONS :

(i) (a) Paddy, G.M. (b) Paddy. (c) N.A. (ii) Laterite, loamy in texture. (iii) 5.11.60 ; 14.10.61 ; 9.11.62. (iv) (a) 5 to 6 ploughings. (b) Transplanting. (c) 18 Kg/ha. (d) 25 cm.×20 cm. (e) 3 to 4. (v) G.M. at 56 Q/ha.+N at 33·6 Kg/ha.+$P_2O_5$ at 33·6 Kg/ha. for 60(68) ; G.L. at 29·6 Q/ha.+28·4 Kg/ha. of $K_2O$ as Mur. Pot.+15·8 Kg/ha. of N as A/s for 61(90) and G.L. at 79 Q/ha.+27·3 Q/ha. of $K_2O$ as Mur. Pot.+17·3 Kg/ha. of N as A/S for 62(29). (vi) C.O. 14 (medium). (vii) Unirrigated for 60(68) ; irrigated for 61(90) and 62(29). (viii) 1 weeding. (ix) 36·7 cm. ; 45 cm. ; 40 cm. (x) 14.2.61 ; 3.2.62 ; 13.2.63.

2. TREATMENTS :

All combinations of (1) and (2)+1 control

(1) 2 sources of $P_2O_5$ : $S_1$=Super and $S_2$=Mg. Phos.

(2) 2 levels of $P_2O_5$ : $P_1$=33·6 and $P_2$=50·4 Kg/ha.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 30·5 m.×7·62 m. (iii) 6. (iv) 6·10 m.×7·62 m. (b) 5·9 m.×7·4 m. (v) 10 cm.×10 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Attack of stem borer. (iii) Tiller counts, and grain yield. (iv) (a) 1960—1962. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments×Years interaction is absent. Hence the results of individual years are presented under 5. Results.

5. RESULTS :

60(68)

(i) 2120 Kg/ha. (ii) 130·9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=2087 Kg/ha.

| | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $P_1$ | 2157 | 2093 | 2125 |
| $P_2$ | 2121 | 2144 | 2132 |
| Mean | 2139 | 2118 | 2128 |

61(40)

(i) 2163 Kg/ha. (ii) 178·8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=2140 Kg/ha.

| | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $P_1$ | 2165 | 2063 | 2114 |
| $P_2$ | 2170 | 2277 | 2224 |
| Mean | 2167 | 2170 | 2169 |

62(29)

(i) 2191 Kg/ha. (ii) 324·4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=2329 Kg/ha.

| | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $P_1$ | 2078 | 2039 | 2058 |
| $P_2$ | 2267 | 2242 | 2254 |
| Mean | 2172 | 2140 | 2156 |

**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 63(19).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'M'.**

Object :—To study whether rock phosphate is effective as a phosphatic fertiliser on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy after paddy. (b) Paddy. (c) G.L. at 7907 Kg/ha.+34 Kg/ha. of $P_2O_5$ as super+28·4 Kg/ha. of $K_2O$ as Mur.. Pot.+22·8 Kg/ha. of N as A/s. (ii) Laterite loamy in texture. (iii) 27.6.63. (iv) (a) 5 ploughings. (b) Transplanting. (c) 18 Kg/ha. (d) 25 cm.×20 cm. (e) 3. (v) G.L. at 7907 Kg/ha.+ 11·4 Kg/ha. of N as A/s+28·4 Kg/ha. of $K_2O$ as Mur. Pot. (vi) M.T.U.3. (170 days). (vii) Unirrigated. (viii) 1 intercultivation. (ix) 322 cm,. (x) 21.10.63.

2. TREATMENTS :

All combinations of (1) and (2)+a control

(1) 2 sources of $P_2O_5$ : $S_1$=Super and $S_2$=Rock. phos.

(2) 2 levels of $P_2O_5$ : $P_1$=37·0 and $P_2$=74·1 Kg/ha.

3. DESIGN :

(i) L. sq. (ii) (a) 5. (b) 30·5 m.×6·1 m, (iii) 5. (iv) (a) 6·1 m.×6·1 m. (b) 5·9 m.×5·9 m. 10 cm.×10 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of cane (Gallfly) noticed—No control measures taken. (iii) Gain and straw yield. (iv) (a) 1963 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3286 Kg/ha. (ii) 259·2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=3211 Kg/ha.

| | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $P_1$ | 3225 | 3369 | 3297 |
| $P_2$ | 3293 | 3334 | 3313 |
| Mean | 3259 | 3352 | 3305 |

**Crop :- Paddy.** **Ref :- Ms. 62(27), 63(17), 64(7), 65(28).**

**Site :- Paddy Breeding Stn., Mangalore. Type :- 'M'.**

Object :—To compare the effect of organic and inorganic manures separately and in combination on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy after Paddy. (b) Paddy. (c) N.A. (ii) Laterite loamy in texture. (iii) 18.11.62 ; 6.11.63 ; 25.8.64 ; 11.11.64 ; 6.8.65/13.11.65. (iv) (a) 5 to 6 ploughings. (b) Transplanting. (c) 18 Kg/ha. (d) 25cm.× 20 cm. for 62(27), 63(17) and 64(7) ; 20 cm.×20 cm. for 65(28). (e) 3. (v) Nil. (vi) CO.25. (vii) Irrigated. (viii) Hand weeding. (ix) 40 cm., 42 cm., 28 cm., 93 cm. (x) 25.2.63 ; 19.2.64 ; 3.3.65 ; 2.3.66.

2. TREATMENTS

10 manurial treatments : $T_1$=Control, $T_2$=F.Y.M. at 19.8 C.L./ha., $T_3$=Inorganic manure equivalent to 19·8 C.L./ha of F.Y.M., $T_4$=19·8 C.L./ha of F.Y.M.+33·6 Kg/ha of N P and K mixture as inorganic mixture, $T_5$=N.P.K. equivalent to 19.8 C.L./ha of F.Y.M.+33·6 Kg/ha. of N, P and K as inorganic manure, $T_6$=9·9 C.L./ha of F.Y.M.+NPK equivalent to 9·88 C.L./ha. of F.Y.M.+33·6 Kg/ha. NPK as inorganic manure, $T_7$=4·9 C.L./ha. of F.Y.M.+NPK equivalent to 14·8 C.L./ha. of F.Y.M.+33·6 Kg/ha. of NPK as inorganic manure, $T_8$=33·6 Kg/ha. of NPK as inorganic manure, $T_9$=NPK equivalent to 5600 Kg/ha. of G.L. as inorganic manure+33·6 Kg/ha. of NPK as inorganic and $T_{10}$=5600 Kg/ha. of G.L.+33·6 Kg/ha. of NPK as inorganic manure.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) 6·1 m.×6·7 m ; 6·1 m.×7·6 m. ; 6·1 m.×6·7 m. ;6·7m.× 6.1 m. (b) 5·9 m.×6·5 m ; 5·9 m.×7·4 m ; 5·7 m.×6·30 m ; 6·7 m.×6·1 m. (v) 10 cm.×10 cm. for 62 and 63 ; 20 cm.×20 cm. for 64 and Nil for 65. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Severe attack of stem borer, No. control measures taken. (iii) Tiller count, and grain yield. (iv) (a) 1962 to 1965. (b) Yes. (c) Results of combined analysis given under 5. (v) and (vi) Nil. (vii) As the error variances are heterogeneous and Treatments×years interaction is absent, results of the individual experiments are presented below.

5. RESULTS :

62(27)

(i) 2351 Kg/ha. (ii) 377·5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 1716 | 1871 | 2896 | 2298 | 2852 | 2721 | 2414 | 2403 | 2047 | 2289 |

C.D.=547·8 Kg/ha.

63(17)

(i) 2436 Kg/ha. (ii) 388·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 1986 | 2265 | 2916 | 2521 | 2754 | 2600 | 2505 | 2485 | 2352 | 2372 |

64(7)

(i) 2975 Kg/ha. (ii) 598·6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 2460 | 2628 | 2691 | 3160 | 3434 | 3288 | 2954 | 3181 | 2973 | 2985 |

65(28)

(i) 2578 Kg/ha. (ii) 375·6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 1977 | 2019 | 2983 | 2297 | 3352 | 2994 | 2882 | 2276 | 2560 | 2441 |

C.D.=545·0 Kg/ha.

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**Crop :- Paddy** (*1st crop*). **Ref :- Ms. 64(3), 65(31).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'M'.**

Object :—To study the effect of trace elements on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy after Paddy. (b) Paddy. (c) Nil. Sandy soil. (iii) 21-5-64/26-6-64 ; 26.6.64/23-6-65. (iv) (a) 5 to 6 ploughings and puddling. (b) Transplanting. (c) 18 Kg/ha., 37 Kg/ha. (d) 25 cm.×20 cm., 20 cm.× 20 cm. (e) N.A. ; 3. (v) G.L. at 2471/Kg/ha.+34 Kg/ha. of $P_2O_5$ as super+27·3 Kg/ha. of $K_2O$ as Mur. Pot.+11·4 Kg/ha of N as A/S for 64(3). Nil for 65(31). (vi) M.G.L—5 (medium). (vii) Unirrigated. (viii) Hand weeding. (ix) 234 cm., 253 cm. (x) 25-9-64, 22-9-65.

2. TREATMENTS :

8 manurial treatments : $T_0$=0, $T_1$=Borax at 6·2 Kg/ha., $T_2$=Mn. Sul. at 56·8 Kg/ha., $T_3$=Zn. Sul. at 17·3 Kg/ha., $T_4$=Mg. Sul. at 17·3 Kg/ha., $T_5$=Fe. Sul. at 29·6 Kg/ha., $T_6$=Cu. Sul. at 19·8 Kg/ha. and $T_7$=Combination of all above.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 6·1 m.×2·4 m. (b) 5·7 m.×2·0 m. (v) 20 cm.× 20 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) (iii) Tiller counts ; Ht. measurements and grain yield. (iv) (a) 1964—1966. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

64(3)

(i) 3459 Kg/ha. (ii) 228·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 3436 | 3404 | 3579 | 3308 | 3492 | 3522 | 3328 | 3605 |

65(31)

(i) 2310 Kg/ha. (ii) 158·6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 2282 | 2278 | 2321 | 2275 | 2369 | 2291 | 2330 | 2334 |

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**Crop :- Paddy** (*First crop*). **Ref :- Ms. 61(35),62(24), 63(18).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'M'.**

Objeci: — To compare the efficiency of nitrophosphate processed by ODDA and PEC process and to study the method of application.

1. BASAL CONDITIONS:

(i) (a) Paddy-Paddy, G.M. (b) G.M., Kohngi, Paddy. (c) N.A. (ii) Laterite loamy in texture. (iii) 22.6.61 ; 29, 30.6.62 ; 11.6.63. (iv) (a) 2 ploughings. (b) Transplanting. (c) 18 Kg/ha. (d) 25 cm.×23 cm. in 61(35), 25 cm. × 20 cm. for other, (e) 3. (v) G.M. at 2965 Kg/ha. in 61(35), G.M. at 7907 Kg/ha. in 62(24), G.M. at 7907 Kg/ha. and 28·4 Kg/ha. of $K_2O$ as Mur. Pot. in 63(18). (vi) PTB-10. (vii) Un-irrigated. (viii) Weeding and intercultivation. (ix) 547 cm., 356 cm., 322 cm. (x) 18.9.1961, 21.9.1962, 14.9.1963.

2. TREATMENTS :

All combinations of (1), (2) and (3)+4 extra treatments

(1) 3 sources of fertilizers: $S_1$=Super+A/S, $S_2$=Nitrophosphate processed by ODDA and $S_3$=Nitro phosphate processed by PEC.

(2) 3 levels of fertilizers: $L_1$=13·4 Kg/ha. of N as A/S+11·8 Kg/ha. of $P_2O_5$ as Super, $L_2$=2 L, and $L_3$=4 $L_1$.

(3) 3 methods of placement of fertilizers : $M_1$=Broadcast, $M_2$=6 cm. below the soil and $M_3$=By pallet method.

$T_0$=Control, $T_1$=13·4 Kg/ha. of N as A/S. $T_2$=2 $T_1$, and $T_3$=4 $T_1$.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 13 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 4·9 m.×4·9 m. (b) 4·7 m.×4·7 m. (v) 10 cm.×10 cm. (vi) Yes.

4. GENERAL:

(i) Fair. (ii) Moderate attack of Kane and leaf roller noticed, controlled by spraying Paramer. (iii) Yield of grain. (iv) (a) 1961-1963. (b) No. (c) Results of combined analysis given under 5. (v) and (vi) Nil. (vii) The treatments in which the roots of the seedlings were applied in the soluton of the fertilizers, heavy mortility of the seedlings were noticed in 62(24). Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 2234 Kg/ha. (ii) 292·1 Kg/ha. (based on 126 d.f. made up of pooled error. (iii) M effect is highly significant. Interactions L×M and S×M are significant. Extra treatments among themselves are highly significant. (iv) Av. yield of grain in Kg/ha.

$T_0$=2020, $T_1$=2264, $T_2$=2367 and $T_3$=2443 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $M_1$ | $M_2$ | $M_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $L_1$ | 2274 | 2135 | 2155 | 2100 | 2132 | 2332 | 2188 |
| $L_2$ | 2290 | 2299 | 2247 | 2268 | 2196 | 2372 | 2279 |
| $L_3$ | 2228 | 2190 | 2138 | 2321 | 1921 | 2314 | 2185 |
| Mean | 2264 | 2208 | 2180 | 2230 | 2083 | 2339 | 2217 |
| $M_1$ | 2369 | 2230 | 2090 | | | | |
| $M_2$ | 1970 | 2077 | 2203 | | | | |
| $M_3$ | 2453 | 2317 | 2248 | | | | |

| | |
|---|---|
| C.D. for M marginal means | =110·2 Kg/ha. |
| C.D. for body of L×M or S×M table | =190·8 Kg/ha. |
| C.D. for extra treatment means | =190·8 Kg/ha. |

| Years | $L_1$ | $L_2$ | $L_3$ | Sig. | $S_1$ | $S_2$ | $S_3$ | Sig. | $M_1$ | $M_2$ | $M_3$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1961 | 1999 | 2049 | 1946 | N.S. | 2007 | 2044 | 1944 | N.S. | 1987 | 1940 | 2068 | N.S. | 2018 | 234·2 |
| 1962 | 2425 | 2496 | 2335 | N.S. | 2386 | 2428 | 2442 | N.S. | 2595 | 2114 | 2546 | ** | 2454 | 302·6 |
| 1963 | 2140 | 2291 | 2276 | N.S. | 2398 | 2153 | 2156 | * | 2108 | 2196 | 2403 | * | 2232 | 330·9 |
| Pooled | 2188 | 2279 | 2186 | N.S. | 2264 | 2208 | 2181 | N.S. | 2230 | 2083 | 2339 | ** | 2234 | 292·1 |

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**Crop :- Paddy** (*First crop*). **Ref :- Ms. 60(59), 61(33), 62(25).**

**Site :- paddy Breeding Stn., Mangalore.** **Type :- 'M'.**

Object :— To find out the optimum combination of N, P and K for Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy, Paddy, G.M. (b) Kolingi (G.M.) ; G.M. ; G.M. and black gram. (c) Nil. (ii) Laterite, loamy in texture. (iii) 16.6.60 ; 14.6.61 ; 14.6.62. (iv) (a) 3 to 5 ploughings. (b) Transplanting. (c) 18 Kg/ha. (d) 20 cm. × 20 cm. for 60(59) ; 25 cm. × 23 cm. for 61(33), 62(25). (e) 3 to 4. (v) 5600 Q/ha. of G.M. for 60(59) ; G.L. at 2965 Q/ha. for 61(33) and G.M at 7907 Q/ha. for 62(65). (vi) M.T.U. 20(medium) for 60 and 61 ; M.G.L. 5 (medium) for 62. (vii) Unirrigated. (viii) One hand weeding. (ix) 181 cm. ; 547 cm. ; 356 cm. (x) N.A. ; 10.10.61 ; 2.9.62.

2. TREATMENTS :

All combinations of (1), (2) and (3).

(1) 3 levels of N as A/s : $N_0=0$, $N_1=33·6$ and $N_2=67·2$ Kg/ha,

(2) 3 levels of $P_2O_5$ as Super : $P_0=0$, $P_1=33·6$ and $P_2=67·2$ Kg/ha.

(3) 3 levels of $K_2O$ as Mur. Pot. : $K_0=0$, $K_1=33·6$ and $K_2=67·2$ Kg/ha.

½ dose of N, all P and K applied at transplanting and other ½ dose of N applied at first hand weeding.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) 43·8 m. × 4·9 m. (iv) (a) 4·9 m. × 4·9 m. (b) 4·7 m. × 4·7 m. (v) 10 cm. × 10 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Incidence of kane, leaf roller ; mild attack of gallfly ; Mild attack of piricuiaria. (iii) Yield of grain and Tiller count (iv) (a) 1959 to 62. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Expt. no 59 (150) also taken into consideration while giving the pooled results. Error variances are heterogeneous and Treatments × years interaction in present.

5. RESULTS :

(i) 2041 Kg/ha. (ii) 414·6 is present (based on 42 d.f. made up of Treatments × years interaction. (iii) Main effects of N and K are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 2157 | 2347 | 2137 | 2131 | 2181 | 2329 | 2214 |
| $N_1$ | 2138 | 1976 | 2119 | 1856 | 2232 | 2146 | 2078 |
| $N_2$ | 1914 | 1745 | 1836 | 1674 | 1746 | 2075 | 1832 |
| Mean | 2070 | 2023 | 2031 | 1887 | 2053 | 2183 | 2041 |
| $K_0$ | 1953 | 1871 | 1837 | | | | |
| $K_1$ | 1999 | 2018 | 2142 | | | | |
| $K_2$ | 2257 | 2179 | 2114 | | | | |

C.D. for N or K means=139 5 Kg/ha.

| Years | $N_0$ | $N_1$ | $N_2$ | Sig. | $P_0$ | $P_1$ | $P_2$ | Sig. |
|---|---|---|---|---|---|---|---|---|
| 1960 | 2438 | 2332 | 1934 | ** | 2317 | 2214 | 2174 | ** |
| 1961 | 2316 | 2288 | 1879 | ** | 2206 | 2202 | 2075 | N.S. |
| 1962 | 2512 | 2575 | 2550 | N.S. | 2577 | 2533 | 2527 | N.S. |
| Pooled | 2422 | 2398 | 2121 | ** | 2367 | 2316 | 2259 | N.S. |

| Years | $K_0$ | $K_1$ | $K_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|
| 1960 | 1971 | 2249 | 2484 | N.S. | 2235 | 414·0 |
| 1961 | 1991 | 2166 | 2327 | ** | 2161 | 222·6 |
| 1962 | 2481 | 2546 | 2610 | N.S. | 2546 | 201·0 |
| Pooled | 2148 | 2320 | 2474 | ** | 2041 | 414·6 |

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**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 60(57), 61(34).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'M'.**

Object :— To find out the most suitable stages for the application of nitrogeneous fertilizers.

1. BASAL CONDITIONS :

(i) (a) Paddy, G.M. (b) G.M. (c) Nil. (ii) Laterite, loamy in texture. (iii) 29.6.60 ; 9.7.61. (iv) (a) 6 ploughings. (b) Transplanting. (c) 18 Kg/ha. (d) 20 cm.×20 cm. (e) 4. (x) G.M. at 5600 Kg/ha.+33·6 Kg/ha. of $P_2O_5$ as Super+33·6 Kg/ha. of $K_2O$ as Mur. Pot. (vi) PTB-9. (vii) Unirrigated. (viii) 1 weeding and interculturing. (ix) 181 cm. ; 588 cm. (x) 14.10.60 ; 3.11.61.

2. TREATMENTS :

6 times of application of 33·6 Kg/ha. of N as A/S : $T_0$=Control, $T_1$=At planting. $T_2$=3 weeks after planting, $T_3$=Half 3 weeks after planting+half at shoot blade stage, $T_4$=$\frac{2}{3}$ at planting+$\frac{1}{3}$rd 3 weeks after planting and $T_5$=$\frac{1}{3}$rd at planting+$\frac{1}{3}$rd 3 weeks after planting+$\frac{1}{3}$ at shoot blade stage.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 4·9 m.×4·9 m. (b) 4·7 m.×4·7 m. (v) 10 cm.×10 cm. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Some attack of gallfly sprayed with Paramar. (iii) Yield of grain. (iv) (a) 1959 to 1962. (b) Yes. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS:

(i) 1532 Kg/ha. (ii) 157·1 Kg/ha. (based on 35 d.f. made up of pooled error and Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1466 | 1570 | 1525 | 1550 | 1494 | 1586 |

| Years | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | Sig | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|
| 1960 | 2168 | 2307 | 2280 | 2223 | 2158 | 2346 | N.S. | 2247 | 175·1 |
| 1961 | 765 | 832 | 770 | 876 | 830 | 825 | N.S. | 816 | 149·3 |
| Pooled | 1466 | 1570 | 1525 | 1550 | 1494 | 1586 | N.S. | 1532 | 157·1 |

**Crop :- Paddy** (*1st crop*). **Ref :- Ms. 64(4), 65(32).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'M'.**

Object :— To find out the effect of lime on the uptake of nutrients.

1. BASAL CONDITIONS :

(i) (a) Paddy, Paddy, G.M. ; Paddy after Paddy. (b) G.M., Paddy. (c) Nil. (ii) Laterite, loamy in texture (1964) ; Sandy soil (1965). (iii) 9.6.1964/4.7.1964 ; 2.6.1965/28.6.1965. (iv) (a) 5 to 6 ploughings, pudding and levelling ; 5 planting and puddling. (b) Transplanting. (c) 18 Kg/ha. ; 37 Kg/ha. (d) 25 cm.×20 cm. 20 cm.×20 cm. (e) 3. (v) G.L. at 2471 Kg/ha.+61·8 Kg/ha. of $K_2O$ as Mur. Pot. (1964). 33·6 Kg/ha. each of N, P and K, N given in 3 split doses in 1965. (vi) P.T.B.-10 (early) (vii) Unirrigated. (viii) Nil (1964), hand weeding and top dressing (1965). (ix) 254 cm ; 163 cm. (x) 23.9.1964 ; 14.9.65.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 2 levels of fertilizers : $F_0$=0 and $F_1$=37·0 Kg/ha. of $P_2O_5$ as Super+49·4 Kg/ha. of N as A/S.

(2) 5 levels of lime : $L_0$=0, $L_1$=2471 Kg/ha. of lime, $L_2$=4942 Kg/ha. of lime, $L_3$=2471 Kg/ha. of Dalomite and $L_4$=4942 Kg/ha. of Dalomite.

All manures applied at planting.

3. DESIGN :

(i) Fact in R.B.D. (ii) (a) 10. (b) 24·4 m.×24·4 m. ; N.A. (iii) 4. (iv) (a) 12·2 m.×4·9 m. (1964) ; 12·2 m.×4·9 m. (1965). (b) 11·8 m.×4·5 m. (1964) ; 12·2 m.×4·9 m. (1965). (v) 20 cm.×20 cm. (vi) Yes.

4. GENERAL :

(i) Good ; Fair. (ii) Not much, Nil. (iii) Tillercount, hight measurements, grain and straw yield. (iv) (a) 1964 to 66. (b) No. (c) As under 5 results. (v) to (vii) Nil.

5. RESULTS :

64(4)

(i) 3833 Kg/ha. (ii) 251·1 Kg/ha. (iv) None of effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $L_0$ | $L_1$ | $L_2$ | $L_3$ | $L_4$ | Mean |
|---|---|---|---|---|---|---|
| $F_0$ | 3554 | 3834 | 3919 | 3862 | 3694 | 3765 |
| $F_1$ | 3972 | 4014 | 3862 | 3824 | 3839 | 3902 |
| Mean | 3763 | 3924 | 3890 | 3843 | 3746 | 3833 |

65(32)

(i) 295 Kg/ha. (ii) 269·5 Rg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $L_0$ | $L_1$ | $L_2$ | $L_3$ | $L_4$ | Mean |
|---|---|---|---|---|---|---|
| $F_0$ | 2871 | 2720 | 3203 | 2869 | 2820 | 2897 |
| $F_1$ | 3138 | 3023 | 3019 | 2905 | 2940 | 3005 |
| Mean | 3004 | 2872 | 3111 | 2887 | 2880 | 2951 |

**Crop :- Paddy (*Rabi*).** **Ref :- Ms. 60(69).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'M'.**

Object :—To find out the most suitable stages for the application of nitrogeneous fertilizers.

1. BASAL CONDITIONS :

(i) (a) Paddy, Paddy. (b) Paddy. (c) G,M. at 5604 Kg/ha.+34 Kg/ha. of $P_2O_5$ as super+33·6 Kg/ha. of N as A/s+28 Kg/ha. of $K_2O$ as Mur. Pot. (ii) Laterite, loamy in texture. (iii) 11-11-60. (iv) (a) 5 ploughings. (b) Planted in lines. (c) N.A. (d) 20 cm. between and within lines. (e) 3. (v) F.Y.M. at 11208 Kg/ha., N as per treatments, $P_2O_5$and $K_2O$ at 33·6 Kg/ha each. (vi) M.G.L.—6 (about 130 days). (vii) Irrigated. (viii) 1 rotary weeding. (ix) 37 cm. (x) 15-2-61.

2. TREATMENTS :

6 manurial treatments : $M_0$=0, $M_1$=29·8 Kg/ha. of N applied at planting, $M_2$=29·8 Kg/ha. of N applied 3 weeks after planting, $M_3$=29·8 Kg/ha. of N applied in 2 doses half at planting and half at shot blade stage $M_4$=21·5 Kg/ha. of N at planting+10·8 Kg/ha. of N 3 weeks after planting and $M_5$=10·8 Kg/ha. of N at planting×10·8 Kg/ha. of N 3 weeks after planting+10·8 Kg/ha. of N at shot blade stage.

N applied as A/S.

3. DESIGN :

(i) R.B.D. (i) (a) 6. (b) 21·9 m.×3·7 m. (iii) 4. (iv) (a) 3·7 m.×3·7 m. (b) 3·5 m.×3·5 m. (v) 10 cm.×10 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Leaf roller at the flowering stage—controlled by dusting with gamaxine. (iii) Tiller counts, height of plants, grain and straw weight. (iv) (a) 1959—62 (Treatments modified every year). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 856 Kg/ha. (ii) 74·8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 674 | 818 | 954 | 939 | 854 | 896 |

CD=112·7 Kg/ha.

**Crop :- Paddy (*IInd crop*).** **Ref :- Ms. 61(41).**

**Site :- Paddy Breeding, Stn., Mangalore.** **Type :- 'M'.**

Object : To find out the most suitable time of application of nitrogeneous fertilizers.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy—G.M. (b) Paddy. (c) G.L. at 2965 Kg/ha.+34 Kg/ha. of N as super+28·4 Kg/ha. of $K_2O$ as Mur. Pot. (ii) Laterite, loamy in texture. (iii) 3-11-61. (iv) (a) 6 ploughings. (b) Transplanting. (c) 18 Kg/ha. (d) 25 cm.×20 cm. (e) 3. (v) G.L. at 2965 Kg/ha.+34 Kg/ha. of N as super+28·4 Kg/ha. of $K_2O$ as Mur. Pot. (vi) M.G.L—6 (medium). (vii) Unirrigated. (viii) 1 weeding and 1 interculturing. (ix) 45 cm. (x) 8-2-62.

2. TREATMENTS :

6 manurial treatments : $M_0$=Control, $M_1$=29·8 Kg/ha. of N applied at planting, $M_2$=29·8 Kg/ha. of N applied 3 weeks after planting, $M_3$=29·8 Kg/ha. of N applied in 2 doses half at planting and half at shot blade stage, $M_4$=21·5 Kg/ha. of N applied at planting +9·9 Kg/ha. of N 3 weeks after planting and $M_5$=9·9 Kg/ha. of N applied at planting+9·9 Kg/ha. of N 3 weeks after planting+9·9 Kg/ha. of N at shot blade stage.

N applied as A/S.

3. DESIGN :

Same as in expt. no 60(69) on page 20.

4. GENERAL :

(i) Good. (ii) Moderate attack of 'sterm borer' sprayed with paramar. (iii) Grain weights and tiller counts. (iv) (a) 1959—1961, (modified every year). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2027 Kg/ha. (ii) 199·5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1927 | 2005 | 2062 | 2064 | 2087 | 2020 |

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**Crop :- Paddy (*IInd crop*).** **Ref :- Ms. 62(68).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'M'.**

Object :—To determine the most effective time of application of nitrogenous fertilizer.

1. BASAL CONDITIONS :

(i) (a) Paddy after paddy. (b) Paddy. (c) G.L. at 7907 Kg/ha.+super at 212·5 Kg/ha.+Mur. pot. at 56·8 Kg/ha.+urea at 24·7 Kg/ha.+A/S at 113·7 Kg/ha. (ii) Laterite, loamy in texture. (iii) 16.11.62. (iv) (a) ploughing 5 to 6 rounds—puddling and levelling. (b) Transplanting. (c) 18 Kg/ha. (d) 25 cm.×20 cm. (e) 3. (v) G.L. at 7907 Kg/ha.+super at 212·5 Kg/ha.+Mur. pot. at 56·8 Kg/ha. (vi) M.G.L.—6. (long). (vii) Irrigated. (viii) Nil. (ix) 40 cm. (x) 2-2-63.

2. TREATMENTS :

6 times of application of 34·6 Kg/ha. of N as A/S : $T_1$=0, $T_2$=at planting, $T_3$=3 weeks after planting, $T_4$=half 3 weeks after planting+half at shot blade stage, $T_5$=2/3rd at planting+$\frac{1}{3}$rd 3 weeks after planting and $T_6$=$\frac{1}{3}$rd at planting+$\frac{1}{3}$rd 3 weeks after planting +$\frac{1}{3}$rd at shot blade stage.

3. DESIGN:

Same as in expt. no. 60(69) on page 20.

4. GENERAL :

(i) Fair. (ii) Not much. (iii) Tiller counts, grain and straw weight. (iv) (a) 1959—62 (modified every year). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2106 Kg/ha. (ii) 138·5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 2009 | 2133 | 2183 | 2091 | 2143 | 2080 |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms: 60(160).**

**Site :- Agri. Rrs. Stn., Mangalore.** **Type :- 'M'.**

Object :—To find the effect of N and P with and without G.M. on the yield of paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) Light red to medium black. (iii) 30-5-60. (iv) (a) Ploughing and harrowings. (b) Drilling. (c) 67 Kg/ha. (d) 30 cm., between rows. (e) N.A. (v) 33·6 Q/ha. of F.Y.M. before sowing. (vi) M 141 (late). (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 92 cm. in whole year. (x) 29-11-60.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 manurial treatments : $M_0$=Control, $M_1$=16·8 Kg/ha. of N as A/S+35·9 Kg/ha. of $P_2O_5$ as super and $M_2$=33·6 Kg/ha. of N as A/S+35·9 Kg/ha. of $P_2O_5$ as super.

(2) 2 G.M. treatments : $G_0$=No. G.M. and $G_1$=33·6 Q/ha. of G.M. (sannhemp).

All the manures applied before sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) 36·6 m.×6·7 m. (iii) 4. (iv) (a) 6·7 m.×6·1 m. (b) 4·6 m. × 3·7 m. (v) 107 cm.×122 cm. (vi) Yes.

4, GENERAL :

(i) Normal. (ii) Nil. (iii) Plant height, grain yield and no. of tillere. (iv) (a) 1958—1960. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3458 Kg/ha. (ii) 383·6 Kg/ha. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $M_0$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|
| $G_0$ | 2984 | 3322 | 3933 | 3413 |
| $G_1$ | 3052 | 3255 | 4204 | 3504 |
| Mean | 3018 | 3288 | 4068 | 3458 |

C.D. for M marginal means=408·7 Kg/ha.

**Crop :- Paddy (*Kharif*).** **Ref -: Ms. 60(162).**

**Site :- Agri. Res. Stn., Mugad.** **Type :- 'M'.**

Object :— To study the effect of Complesal fertilizer on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) Light red to medium black. (iii) 27.5.60. (iv) (a) Ploughings and horrowings. (b) Drilling. (c) 67 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) 33·6 Q/ha. of F.Y.M. before sowing. (vi) M-141. (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 92 cm. in whole year. (x) 30.11.60.

2. TREATMENTS :

8 manurial treatments : $M_0$=Control, $M_1$=168·1 Kg/ha. of complesal at planting, $M_2$=168·1 Kg/ha. of complesal $\frac{1}{2}$ at planting and $\frac{1}{2}$ one month after, $M_3$=168·1 Kg/ha. of A/S at palnting, $M_4$=168·1 Kg/ha. of A/S $\frac{1}{2}$ at planting $\frac{1}{2}$ one month after, $M_5$=84·1 Kg/ha. of A/S at planting+112·1 Kg/ha. of C/N one month after planting, $M_6$=84·1 Kg/ha. of A/S at planting+84·1 Kg/ha. of C/A/N one month after planting and $M_7$=168·1 Kg/ha. of A/S+201·8 Kg/ha. of Super $\frac{1}{2}$ at planting and $\frac{1}{2}$ after one menth.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) 36·6 m.×6·1 m. (iii) 4. (iv) (a) 6·1 m.×4·6 m. (b) 4·6 m.×3·4 m. (v) 76 cm. ×61 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Plant height, fertile tiller and graid yield. (iv) (a) 1959-61 (Treatments were modified in 1961). (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3653 Kg/ha. (ii) 724·5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 2885 | 3847 | 3255 | 3625 | 4217 | 3699 | 3477 | 4217 |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 61(151).**

**Site :- Agri. Res. Stn., Mugad.** **Type :- 'M',**

Object :— To study the effect of complesal fertilizers on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. ( ii) Light red to medium black. (iii) 14.6.61. (iv) (a) Ploughings and harrowings. (b) Drilling. (c) 67 Kg/ha. (d) 30 cm.between rows. (e) N.A. (v) 12·4 C.L./ha. of F.Y.M. (vi) M-141 (late). (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 140 cm. in whole pear. (x) 6.12.61.

2. TREATMENTS and DESIGN :

Same as in expt. no. 60(162) on page 23. 201·8 Kg/ha. of Super was applied to treatments $M_3$ to $M_6$ at sowing.

4. GENERAL :

(i) Normal. (ii) Light attack of blue beetles in the month of Aug. and folidol was spraped twice. (iii) Plant height, fertile tillers and grain yield. (iv) (a) 1959-1961 (modified in 61). (b) and (c) N.A. (v) Nil. (vi) Due to flood some portion of the crops were damaged on 16.7.61. (vii) Nil.

5. RESULTS :

(i) 2916 Kg/ha. (ii) 700·3 Kg/ha. (iii) The treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 2221 | 2815 | 2889 | 2592 | 2666 | 2740 | 3257 | 4146 |

C.D.=1030·0 Kg/ha.

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**Crop :- Paddy** **Ref :- Ms. 62(138), 63(151), 64(111), 65(108).**

**Site :- Agri. Res. Stn., Mugad.** **Type :- 'M'.**

Object :— To study the effect of organic and inorganic manures on the yield of drilled Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 12·4 C.L./ha. of F.Y.M.+33·6 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$ for 62(138), As per treatments for others. (c) Light red to medium black. (iii) 13.6.62 ; 11.5.63 ; 3.6.64 ; 2.6.65. (iv) (a) Ploughing, harrowing, clod crushing and grubbing. (b) Drilling. (c) 67 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) M-114 (late). (vii) Unirrigated. (viii) Interculturing and weeding. (ix) 97 cm. in whole year ; 84 cm. ; 114 cm ; 104 cm. (x) 2.12.62 ; 25.11.63 : 5.11.64 ; 17.12.65.

2. TREATMENTS:

10 manurial treatments : $M_0$=Control (no manure), $M_1$=33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$, $M_2$= 12·4 C.L./ha. of F.Y.M., $M_3$=Inorganic manures equivalent to 12·4 C.L./ha. of F.Y.M., $M_4$=$M_1$+12·4 C.L./ha. of F.Y.M., $M_5$=$M_1$+NPK equivalent to 12·4 C.L./ha. of F.Y.M., $M_6$=$M_1$+6·2 C.L./ha. of F.Y.M.+NPK equivalent to 6·2 C.L./ha. of F.Y.M., $M_7$=$M_1$+3·1 C.L./ha. of F.Y.M.+NPK equivalent to 9·3 C.L./ha. of F.Y.M..$M_8$=$M_1$+NPK equivalent to 56 Q/ha. of G.L. and $M_9$=56 Q/ha. of G.L.

$P_2O_5$ as Super, $K_2O$ as Mur. Pot. and F.Y.M. were applied before sowing, N as A/S was applied in 3 doses: at sowing, at planting (40 to 45 days after sowing) and before flowering. *Sannhemp* wes applied as G.M. at planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) 36·6 m.×11·0 m. (iii) 4. (iv) (a) 11·0 m.×3·7 m. (b) 8·0 m.×2·4 m. (v) 103 cm.×61 cm (vi) Yes.

4. GENERAL :

i) Due to insufficient moisture germination was not satisfactory and so gap filling was done on 6,7.72 by dibbling for 62(138). Satisfactory for others. (ii) Light attack of blue beetles and the same was controlled by spraying Folidol for 62(138). Nil for others. (iii) Plant ht., No of tillers and grain yield. (iv) (a) 1962-65. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are hetrogeneous and Treatments×years interaction is absent. Hence the results of individual years are presented under 5. Results.

5. RESULTS :

**62(138)**

2937 Kg/ha. (ii) 255·0 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_4$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ | $M_8$ | $M_9$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 2486 | 3010 | 2498 | 3057 | 2782 | 3091 | 3000 | 3180 | 3262 | 3000 |

C.D.=370·0 Kg/ha.

**63(151)**

(i) 4571 Kg/ha. (ii) 520·3 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ | $M_8$ | $M_9$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 3520 | 5021 | 3883 | 4348 | 4245 | 5337 | 4452 | 5228 | 5021 | 4659 |

C.D.=755·0 Kg/ha.

**64(111)**

(i) 3495 Kg/ha. (ii) 287·4 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ | $M_8$ | $M_9$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 2623 | 3717 | 2965 | 3592 | 3501 | 4208 | 3375 | 3729 | 3535 | 3706 |

C.D.=417·1 Kg/ha.

**65(108)**

(i) 2942 Kg/ha. (ii) 443·0 Kg/ha. (iii) Treatment differences are highly significant (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ | $M_8$ | $M_9$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 2338 | 3022 | 2110 | 3250 | 2566 | 3421 | 2851 | 3364 | 3649 | 2851 |

C.D.=642·9 Kg/ha.

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**Crop :- Paddy (*Kharif*).** **Ref ;- Ms. 60(161), 61(150), 62(136).**

**Tite :- Agri. Res. Stn., Mugad.** **Type :- 'M'.**

Object :— To find out the Nitrogeneous fertilizers for Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) Light red to medium black. (iii) 29.5.60 ; 10.6.51, 12.6.62. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 67 Kg ha. (d) 30 cm. between rows. (e) N.A. (v) Nil in 60(161) and 62(186). 33·6 Q/ha. of F.Y.M.+35·9 Kg/ha. of $P_2O_5$ applied before sowing in 61(150). (vi) M-14 (late). (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 92 cm., 140 cm. 97 cm. (x) 21.11.60 ; 5.12.61 ; 2.12.62.

2. TREATMENTS :

7 sources of N at 33·6 Kg/ha. : $S_0$=Control, $S_1$=A/S, $S_2$= A/N, $S_3$=A/C, $S_4$=Urea, $S_5$=A/S/N, and $S_6$=C/N.

F.Y.M. was applied to $S_3$ plots as A/C was not available. All the manures applied at planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) 51·2 m.×10·4 m. (iii) 4. (iv) (a) 10·4 m.×7·3 m. (b) 8·5 m.×4·9 m. (v) 91 cm.×122 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of blue beetles during Aug. and Sept. and folidol was sprayed in 62(136). (iii) Yield of grain. (iv) (a) 1959-62. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) Nil. (vi) Plants were washed away due to floods on 16.7.61. Gap filling was done for 61(150). The season was quite abnormal. No moisture at the time of germination and rain during the year was 97 cm. against an average of 121 cm. for 62(136). (vii) Results of expt. no 59(7) are also taken into account while giving the Pooled results. Error variances are homogeneous Treatments×years interaction is present.

5. RESULTS:

(i) 3331 Kg/ha. (ii) 461·9 Kg/ha. (based on 18 d.f. made up of Treatments × years interaction. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatmen | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S^4$ | $S_5$ | $S_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 3296 | 3352 | 3468 | 3326 | 3475 | 3550 | 2848 |

C.D. = 343·1 Kg/ha.

| | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 3323 | 3378 | 3814 | 3024 | 3324 | 3787 | 2534 | ** | 3312 | 282·9 |
| 1961 | 2802 | 2701 | 2565 | 2782 | 2646 | 2891 | 2454 | N.S. | 2692 | 273·2 |
| 1962 | 3600 | 3981 | 4008 | 3954 | 4171 | 3872 | 3081 | ** | 3810 | 312·8 |
| Pooled | 3242 | 3353 | 3462 | 3253 | 3380 | 3517 | 2690 | ** | 3271 | |

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**Crop :- Paddy** (*Kharif*).

**Ref :- Ms. 62(*s*50), 63(150), 64(109)**

**Site :- Agri. Res. Stn., Mugad.**

**Type :- 'M'.**

Object :—To find out the optimum dose of N, P and K for drilled paddy.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) 5 Q/ha F.Y.M.+33·6 Kg/ha. of N+35·8 Kg/ha. of $P_2O_5$. (ii) Clay loam. (iii) 31-5-62, 11-5-63. (iv) (a) Ploughing, harrowing and clod crushing. (b) By seed drill. (c) 67 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) 56 Q/ha. of F.Y.M. (vi) M 141 (late). (vii) Unirrigated. (viii) Interculturing, weeding and gap. filling. (ix) 97 cm., 84 cm., 113 cm. (x) 2-12-62 ; 25-11-63 ; 3-12-64.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=33{\cdot}6$ and $N_2=67{\cdot}2$ Kg/ha
(2) 3 levels of $P_2O_5$ as super., $P_0=0$, $P_1=33{\cdot}6$ and $P_2=67{\cdot}2$ Kg/ha.
(3) 3 leves of $K_2O$ as Mur. Pot. : $K_0=0$, $K_1=33{\cdot}6$ and $K_2=67{\cdot}2$ Kg/ha.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 13·37 m. × 4·89 m. (b) 10·97 m. × 3·69 m. (v) 120 cm. × 60 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962—1964. (b) No. (c) Results of combined analysis are presented under 5 Results. (v) Nil. (vi) The season was abnormal due to insufficient rainfall in 62(150). (viii) Error variances are homogeneous and Treatments × years interaction is absent.

5. RESULTS :

(i) 3690 Kg/ha, (ii) 369·9 Kg/ha. (based on 54 d.f. made up of Treatments × years interaction and pooled error. (iii) Main effect of N is highly significant. Interaction P × N is significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $P_0$ | 3371 | 3367 | 4174 | 3569 | 3878 | 3465 | 3637 |
| $P_1$ | 3457 | 3863 | 3925 | 3860 | 3633 | 3752 | 3748 |
| $P_2$ | 3186 | 3835 | 4037 | 3687 | 3709 | 3663 | 3686 |
| Mean | 3338 | 3688 | 4045 | 3705 | 3740 | 3626 | 3690 |
| $K_0$ | 3250 | 3680 | 4186 | | | | |
| $K_1$ | 3444 | 3779 | 3997 | | | | |
| $K_2$ | 3320 | 3606 | 3953 | | | | |

C.D. for N marginal means=211·5 Kg/ha.
C.D. for body of N×P table=366·3 Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | Sig. | $P_0$ | $P_1$ | $P_2$ | Sig. | $K_0$ | $K_1$ | $K_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | 3110 | 3283 | 3343 | N.S, | 3104 | 3371 | 3261 | N.S. | 3245 | 3222 | 3269 | N.S. | 3245 | 224·6 |
| 1963 | 4169 | 4669 | 5090 | ** | 4666 | 4655 | 4607 | N.S. | 4682 | 4791 | 4455 | N.S. | 4643 | 446·0 |
| 1964 | 2735 | 3115 | 3704 | ** | 3142 | 3220 | 3192 | N.S. | 3189 | 3209 | 3156 | N.S. | 3185 | 401·3 |
| Pooled | 3338 | 3689 | 4046 | ** | 3637 | 3749 | 3687 | N.S. | 3705 | 3741 | 3627 | N.S. | 3691 | 369·9 |

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**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 61(153), 62(137), 63(152)**
**Site :- Agri. Res. Stn., Mugad.** **Type :- 'M'.**

Object :—To study the effect of Mg. phos. Vs super on the yield of drilled Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 12·35 C.L./ha. of F.Y.M.+33·6 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$. (ii) Light red to medium black. (iii) 13-6-61; 12-6-62; 11-5-63. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 67 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) 12·35 C.L./ha. of F.Y.M.+33·6 Kg/ha. of N in 2 doses at sowing and at planting. (vi) A 200 (late) for 61(153) and 63(152), M 141 (late) for 62(137). (vii) Unirrigated. (viii) Interculturing and weeding. (ix) 140 cm., 97 cm; 84 cm. (x) 6-12-61 ; 2-12-62 ; 1-12-63.

2. TREATMENTS :

All combinations of (1) and (2)+a control
(1) 2 sources of $P_2O_5$ : $S_1$=Super and $S_2$=Magnesium phosphate
(2) 2 levels of $P_2O_5$ : $P_1$=33·6 and $P_2$=50·4 Kg/ha. fertilisers applied at sowing.

3. DESIGN :

(i) L. sq. (ii) (a) 5. (b) 30·48 m.×6·71 m. (iii) 5. (iv) (a) 6·71 m.×6·10 m. (b) 5·49 m.×4·88 m. (v) 61 cm.×61 cm. (vi) Yes.

4. GENERAL :

(i) Germination was not satisfactory due to insufficient moisture, gap. filling was done on 6-7-62 by dibbling in 62(137). Normal for others. (ii) Light attack of blue beetle controlled by spraying with folidol. (iii) Yield of grain and tiller counts. (iv) (a) 1961—1963. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) Nil. (vi) Season was abnormal due to insufficient rains. (vii) Error variances are homogeneous. Treatments×years interaction is absent.

5. RESULTS :

(i) 3613 Kg/ha. (ii) 355·8 Kg/ha. (based on 44 d.f, made up of Treatments×years interaction and pooled error). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=3586 Kg/ha.

| | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $P_1$ | 3698 | 3462 | 3580 |
| $P_2$ | 3654 | 3666 | 3660 |
| Mean | 3676 | 3564 | 3620 |

| Years | $P_1$ | $P_2$ | Sig | $S_1$ | $S_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|
| 1961 | 2716 | 2716 | N.S. | 2782 | 2649 | N.S. | 2729 | 392·6 |
| 1962 | 3597 | 3649 | N.S. | 3682 | 3563 | N.S. | 3571 | 398·2 |
| 1963 | 4428 | 4615 | N.S. | 4564 | 4480 | N.S. | 4541 | 259·4 |
| Pooled | 3580 | 3660 | N.S. | 3676 | 3564 | N.S. | 3613 | 355·8 |

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**Drop :- Paddy (*Kharif*).** **Ref :- Ms. 61(152), 62(149), 63(153)**

**Site :- Agri. Res. Stn., Mugad.** **Type :- 'M'.**

Object : To compare the effect of Nitrophosphate by ODDA and PEC Process at different levels and methods of applications on paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) Light red to medium black for '61 and '63 ; clay loam for '62. (iii) 17.6.61 ; 28.6.62 ; 24.5.63. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 67 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) 12.35 C.L./ha. of F.Y.M. before sowing for 61(152) and 63(153) and 56 Q/ha. of F.Y.M. for 62(149). (vi) A—200 (late). (vii) Unirrigated. (viii) Interculturing and weeding. (ix) 140 cm., 97 cm., 84 cm. (x) 5.12.61 ; 12.12.62, 2.12.63.

2. TREATMENTS :

All combinations of (1), (2) and (3)+4 extra treatments

(1) 3 manurial treatments ; $T_1$=13·5 Kg/ha. of N+11·8 Kg/ha. of P., $T_2$=26·9 Kg/ha. of N+23·5 Kg/ha. of P and $T_3$=53·8 Kg/ha. of N+47·1 Kg/ha. of P.

(2) 3 Types of fertilizers : $F_1$=P as super+N as A/S, $F_2$=ODDA and $F_3$=PEC.

(3) Methods of placement : $M_1$=Broadcast $M_2$=6 cms. below seed and $M_3$=Band placement.

(4) Extra Treatment : $N_0$=0 ; $N_1$=13·5 ; $N_2$=26·9 and $N_3$=53·8 Kg/ha. of N as A/S.

3. DESIGN :

(i) $3^3$ confd. with 4 extra treatments. (ii) (a) 13 plots/block ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 5·49 m.×4·88 m. (b) 4·88 m.×4·27 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 to 1963. (b) Yes. (c) Results of combined analysis are presented under 5 Results. (v) and (vi)Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS

(i) 3046 Kg/ha. (ii) 438·8 Kg/ha. (based on 54 d.f. made up of pooled error and Treatments×years interaction). (iii) Effects of F and T are highly significant. (iv) Av. yield of grain in Kg/ha. $N_0$=2640, $N_1$=2910, $N_2$=2933 and $N_3$=3644 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $T_1$ | $T_2$ | $T_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $F_1$ | 3199 | 3161 | 3421 | 2938 | 3355 | 3488 | 3260 |
| $F_2$ | 2839 | 2939 | 2788 | 2773 | 2751 | 3042 | 2855 |
| $F_3$ | 3035 | 2806 | 3290 | 2764 | 3054 | 3313 | 3044 |
| Mean | 3025 | 2969 | 3166 | 2825 | 3053 | 3281 | 3053 |
| $T_1$ | 2881 | 2775 | 2819 | | | | |
| $T_2$ | 2933 | 2957 | 3270 | | | | |
| $T_3$ | 3259 | 3174 | 3410 | | | | |

C.D. for F or T marginal means=238·9 Kg/ha.

| Years | $F_1$ | $F_2$ | $F_3$ | Sig. | $M_1$ | $M_2$ | $M_3$ | Sig. | $T_1$ | $T_2$ | $T_3$ | Sig. | $N_1$ | $N_2$ | $N_3$ | | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1961 | 3272 | 2739 | 3030 | * | 3005 | 2836 | 3200 | N.S. | 2933 | 2763 | 3345 | ** | 2617 | 2837 | 2691 | 3417 | * | 2976 | 332.2 |
| 1962 | 2680 | 1949 | 2151 | ** | 2046 | 2217 | 2518 | N.S. | 1907 | 2301 | 2572 | ** | 1593 | 1676 | 2109 | 3226 | ** | 2226 | 385·9 |
| 1963 | 3830 | 3878 | 3951 | N.S. | 4024 | 3855 | 3781 | N.S. | 3636 | 4097 | 3927 | N.S. | 3709 | 4218 | 4000 | 4290 | N.S. | 3938 | 476·6 |
| Pooled | 3260 | 2855 | 3044 | ** | 3025 | 2969 | 3166 | N.S. | 2825 | 3053 | 3281 | ** | 2640 | 2910 | 2933 | 3644 | N.S. | 3046 | 438·8 |

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**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 65(23)**

**Site :- Agri. Res. Stn., Nagwhally.** **Type :- 'M'.**

Object :—To study the response of paddy crop. to high doses of N, P and K.

1. BASAL CONDITIONS :

(i) (a) Paddy, G.M. paddy. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) 22.6.65/28.7.65. (iv) (a) Summer ploughing, incorporation of G.M. by ploughing and puddling. (b) Transplanting. (c) 49 Kg/ha. (d) 20 cm.×20 cm. (e) N.A. (v) G.M. at 5600 Kg/ha. (vi) S 1092 late. (vii) Irrigated. (viii) Hand weeding, working with T.P.C. weeder, top dressing A/S. (ix) 29 cm. (x) 11.1.66.

2. TREATMENTS :

15 manurial treatments : $T_0$=Control, $T_1$=33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$, $T_2$=44·8 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+33·6 Kg/ha. of $K_2O$, $T_3$=44·8 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$, $T_4$=50·4 Kg/ha. of N+39·2 Kg/ha. of $P_2O_5$+39·2 Kg/ha. of $K_2O$, $T_5$=60·4 Kg/ha. of N+50·4 Kg/ha. of $P_2O_5$+50·4 Kg/ha. of $K_2O$, $T_6$=56·0 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$, $T_7$=56·0 Kg/ha. of N+56·0 Kg/ha. of $P_2O_5$+56·0 Kg/ha. of $K_2O$, $T_8$=61·6 Kg/ha. of N+50·4 Kg/ha. of $P_2O_5$+50·4 Kg/ha. of $K_2O$, $T_9$=61·6 Kg/ha. of N+61·6 Kg/ha. of $P_2O_5$+61·6 Kg/ha. of $K_2O$, $T_{10}$=67·2 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$, $T_{11}$=67·2 Kg/ha. of N+50·4 Kg/ha. of $P_2O_5$+50·4 Kg/ha. of $K_2O$, $T_{12}$=67·2 Kg/ha. of N+56·0 Kg/ha. of $P_2O_5$+56·0 Kg/ha of $K_2O$, $T_{13}$=67·2 Kg/ha. of N+61·6 Kg/ha. of $P_2O_5$+61·6 Kg/ha. of $K_0$ and $T_{14}$=67·2 Kg/ha. of N+67·2 Kg/ha. of $P_2O_5$+67·2 Kg/ha. of $K_2O$.

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 2. (iv) (a) 9·14 m.×3·66 m. (b) 8·23 m.×2·74 m. (v) 2 rows on each side.

4. GENERAL :

(i) Fair. (ii) Considerable incidence of stem borer folidol spray given. (iii) Yield of grain. (iv) (a) to (c) No. (v) N.A. (vi) to (vii) Nil.

5. RESULTS :

(i) 1623 Kg/ha. (ii) 284·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 1373 | 1838 | 1772 | 1705 | 1418 | 1772 | 2259 | 1772 |

| | $T_8$ | $T_9$ | $T_{10}$ | $T_{11}$ | $T_{12}$ | $T_{13}$ | $T_{14}$ |
|---|---|---|---|---|---|---|---|
| | 1971 | 1262 | 1351 | 1661 | 1462 | 1351 | 1373 |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 65(20):**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'M'.**

Object :— To study the effect of basic slag in combination with organic wastes on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) 13.8.65/11.9.65. (iv) (a) Summer ploughing, serving green manures crop. Puddling. (b) Transplanting. (c) 49·4 Kg/ha. (d) 20 cm.×20 cm. (e) N.A. (v) Nil. (vi) S-1092 (late). (vii) Irrigated. (viii) Hand weeding, working T.P.C. weeder and top dressing with A/S. (ix) 24·8 cm. (x) 8.1.66.

2. TREATMENTS :

6 manurial treatments : $T_0$=Control, $T_1$=Basic slag at 30 Kg/ha. of $P_2O_5$, $T_2$=Water Hyacinth at 40 Kg/ha. of N, $T_3$=$T_1$+$T_2$, $T_4$=44 Kg/ha. of N as A/S and $T_5$=$T_1$+$T_4$.

3. DESIGN:

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 9·1 m.×4·6 m. (v) 2 rows on either side. (vi) Yes.

4. GENERAL

(i) Fair-Not lodged. (ii) Considerable incidence of stem borer folidol sprayed. (iii) Grain yield. (iv) (a) 1965 only. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1286 Kg/ha. (ii) 289·6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1304 | 1256 | 1148 | 1483 | 885 | 1638 |

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**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 65(26):**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'M'.**

Object :— Utilisation of blue green Algal and control of Algal weeds.

1. BASAL CONDITIONS :

(i) (a) No. (b) Paddy. (c) N.A. (ii) Red sandy loam. (iii) 22.6.65/9.8.65. (iv) (a) 4 ploughings, puddling and levelling. (b) Transplanting. (c) 49·4 Kg/ha. (d) 20 cm.×20 cm. (e) N.A. (v) Nil. (vi) S-1092 (long). (vii) Irrigated. (viii) Hand weeding, working J.P.C. weeder. (ix) 29·0 cm. (x) N.A.

2. TREATMENTS :

6 manurial treatments : $T_0$=Control (No manure), $T_1$=Partial soil sterilization (Rabbing), $T_2$=$T_1$+Algal. $T_3$=Fertilizer mixture (lime 1000 Kg/ha.+20 Kg/ha. of $P_2O_5$+0·28 Kg/ha. of sod. Molybdate, $T_4$=Rabbing+20 Kg/ha. of N as A/S+Algal. and $T_5$=20 Kg/ha. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 8·1 m.×6·1 m. (b) 7·1 m.×5·1 m. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Stem borer-sprayed Helmenthosperiums. (iii) Yield of grain. (iv) (a) to (c) No. (v) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 2125 Kg/ha. (ii) 362·8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 2276 | 2129 | 1932 | 2240 | 2082 | 2093 |

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**Crop :- Paddy** (*Kharif*) **Ref :- Ms. 61(19), 62(18), 63(8).**

**Site :- Agri. Res., Stn., Nagenhally.** **Type :- 'M'.**

Object :— Testing the effect of nitrophosphate complex fertilizers, produced by O.D.D.A. and P.E.C. process and the different methods of application of the fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) 3923 Kg/ha. of G.M.+11208 Kg/ha. of F.Y.M.+33·6 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$ for 61(19) ; 22·4 Kg/ha. of $P_2O_5$ for 62(18) and G.L. 5600 Kg/ha. for 63(5). (ii) Sandy loam. (iii) 18.7.61/17.8.61 ; 4.7.62/31.7.62 ; 18.7.63. (iv) (a) 1 to 4 ploughings, 2 puddlings and levelling. (b) Transplanting. (c) —. (d) 23 cm.×23 cm. (e) 2 to 3. (v) As per treatments. (vi) S-701 (late) for 61(19), and S-665 (mid late) for 62(18) and 63(5). (vii) Irrigated. (viii) Passing J.P,C. and hand weeding (ix) 51 cm. ; 47 cm. ;36 cm. (x) 18.12.61 ; 18.10.62 : 26.12.63.

## 2. TREATMENT:

All combinations of (1), (2) and (3)+4 extra treatments.

(1) 3 sources of fertilizers : $S_1$=Super+A/S, $S_2$=Nitrophosphate processed by O.D.D.A. and $S_3$= Nitrophosphate processed by P.E.C.

(2) 3 levels of fertilizers : $L_1$=13·4 Kg/ha. of N as A/S+11·8 Kg/ha. of $P_2O_5$ as Super, $L_2$=2 $L_1$ and $L_3$=4 $L_1$.

(3) 3 methods of placement of fertilizers : $M_1$=Broadcast, $M_2$=6 cm. below the soil and $M_3$=by pallet method.

$T_0$=Control, $T_1$=13·4 Kg/ha. of N as A/S, $T_2$=2 $T_1$ and $T_3$=4 $T_1$.

## 3. DESIGN:

(i) $3^3$ confd.+4 extra treatments. (ii) (a) 13 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 12·3 m.×3·7 m.; 8·0 m.×4·6 m.; 16·6 m.×3·7 m. for $m_1$. 11·1 m.×3·7 m. for $M_2$ and 6·6 m.×3·7 m. for $M_3$ for 63(8). (b) 11·4 m.×2·7 m. ; 7·0 m.×3·7 m. 15·9 sq. for 63(8). (v) 46 cm.×46 cm. (vi) Yes.

## 4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain and Tiller counts. (iv) (a) 1961 to 1963. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) Mangalor. (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

## 5. RESULTS :

(i) 2777 Q/ha. (ii) 386·1 Kg/ea. (iii) Effect due to extra treatments is significant. Main effect of M and L are highly significant and due to S and interaction L×S are significant. (iv) Av. yield of grain in Kg/ha.

$T_0$=2520, $T_1$=2593, $T_3$=1524 and $T_4$=2912 Kg/ha.

| | $L_1$ | $L_2$ | $L_3$ | $S_1$ | $S_2$ | $S_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $M_1$ | 2604 | 2934 | 2988 | 3027 | 2818 | 2680 | 2842 |
| $M_2$ | 2962 | 2947 | 3116 | 3194 | 2974 | 2857 | 3008 |
| $M_3$ | 2464 | 2718 | 2821 | 2693 | 2620 | 2690 | 2667 |
| Mean | 2677 | 2866 | 2975 | 2971 | 2804 | 2742 | 2839 |
| $S_1$ | 2832 | 3161 | 2921 | | | | |
| $S_2$ | 2428 | 2943 | 3041 | | | | |
| $S_3$ | 2770 | 2495 | 2962 | | | | |

C.D. for T means or body of L×S table=236·4 Kg/ha.
C·D. for M or L means =136·4 Kg/ha.

| Years | $M_1$ | $M_2$ | $M_3$ | Sig. | $L_1$ | $L_2$ | $L_3$ | Sig. |
|---|---|---|---|---|---|---|---|---|
| 1961 | 28 5 | 3207 | 2800 | * | 2799 | 3048 | 2994 | N.S. |
| 1962 | 2649 | 2619 | 2303 | ** | 2411 | 2474 | 2689 | N.S. |
| 1963 | 3041 | 3199 | 2900 | * | 2821 | 3076 | 3243 | ** |
| Pooled | 2842 | 3008 | 2667 | ** | 2677 | 2866 | 2975 | ** |

| $S_1$ | $S_2$ | $S_3$ | Sig. | $T_1$ | $T_2$ | $T_3$ | $T_4$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 3137 | 2977 | 2729 | * | 2126 | 2445 | 2232 | 3136 | N.A. | 2805 | 454·9 |
| 2642 | 2456 | 2476 | N.S. | 2456 | 2382 | 2229 | 2490 | N.A. | 2484 | 356·0 |
| 3138 | 2980 | 3023 | N.S. | 2979 | 2953 | 3111 | 3111 | N.A. | 3044 | 337·0 |
| 2972 | 2804 | 2742 | * | 2520 | 2593 | 2524 | 2912 | * | 2777 | |

**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 60(170), 61(163), 62(143).**

**Site :- Agri. Res. Stn., Nagenhally,** **Type :- 'M'.**

Object :— To study the influence of top dressing of N in split dose on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) G.M. (c) N.A. (ii) Red sandy loam. (iii) 14.7.60/6.8.60 ; 26.6.61/26.7.61 ; 11.7.62/2.8.62. (iv) (a) 4 ploughings+1 puddling. (b) Transplanting. (c) 22·4 Kg/ha. (d) 23 cm.×23 cm. (e) 2 to 3. (v) 56 Q/ha. of G.M.+11·2 Q/ha. of F.Y.M. for 60 and 61 ; Nil. (vi) SR.-26 B. (vii) Irrigated. (viii) Passing J.P.C. and hand weeding. (ix) 33 cm. ; 42 cm. ; 37 cm. (x) 26.11.60 ; 29.11.61 ; 19.11.62.

2. TREATMENTS :

5 methods of application of N : $T_1=\frac{1}{2}$ at planting$+\frac{1}{2}$ at weeding, $T_2=8·4$ Kg. at planting$+16·8$ Kg. at 6 weeks$+8·4$ Kg. 12 weeks after planting, $T_3$=In 6 equal doses of 5·6 Kg. each at an interval of 3 weeks, $T_4$=In one full dose at planting and $T_5$=In one full dose at flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 3·9 m.×9·8 m. (b) 3·0 m.×8·0 m. (v) 46 cm.×92 cm. (vi) Yes.

4. GENERAL ;

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960 to 1962. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) As the error variances are heterogeneous and Treatments×years interaction is absent, results of the individual experiments are presented below.

5. RESULTS ;

**60(170)**

(i) 3188 Kg/ha. (ii) 337·5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. yield | 2934 | 3422 | 3373 | 3130 | 3081 |

**61(163)**

(i) 3911 Kg/ha. (ii) 703·3 Kg/ha. (iv) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. yield | 3575 | 3995 | 3994 | 4100 | 3890 |

**62(143)**

(i) 2485 Kg/ha. (ii) 1223·9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. yield | 2703 | 2841 | 2471 | 2379 | 2031 |

**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 62(16), 64(105).**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'M'.**

Object :—To study the role of organic manure comparring with the inorganic manure on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy ; bulk crop. (c) 3362 to 4483 Kg/ha. of G.M.+44·8 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as super for 62(16) and 36·3 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+56 Q/ha. of F.Y.M. for 64(105). (ii) Sandy loam. (iii) 4.7.62/30.7.62 ; 16.7.64/17.9.64. (iv) (a) 4 ploughings. (b) Transplanting. (c) N.A. (d) 23 cm ×23 cm. (e) 2 to 3. (v) Nil. (vi) S.661 (late) : S.1092 (long). (vii) Irrigated. (viii) Passing Japanees rotary weeder and hand weeding. (x) 47 cm. ; 55 cm. (x) 12.12.62 ; 10.1.65.

2. TREATMENTS :

10 manurial treatments : $T_1$=Control ; $T_2$=67·3 Q/ha. of F.Y.M., $T_3$=Inorganic manure equivalent to 67·3 Q/ha. of F.Y M., $T_4$=67·3 Q/ha. of F.Y.M.+33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as super, $T_5$=N equivalent to 67·3 Q/ha. of F.Y.M.+33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as super, $T_6$=33·8 Q/ha. of F.Y.M+N equivalent to 33·8 Q/ha. of F.Y.M.+33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as super, $T_7$=16·8 Q/ha. of F.Y.M.+N equivalent to 50·4 Q/ha. of F.Y.M. +33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as super, $T_8$=33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as super, $T_9$=N equivalent to 56·0 Q/ha. of G.M. +33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as super and $T_{10}$=56·0 Q/ha. of G.M.+33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as super.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×3·4 m ; 3·7 m.×9·1 m. (b) 8·2 m.×2·5 m ; 3.7 m.×9·1 m. (v) 46 cm.×46 cm. ; Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962—65 (Not conducted in 63 and modified in 65). (b) No. (c) Results of combined analysis are presented under 5 Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 1729 Kg/ha. (ii) 368·3 Kg/ha. (based on 63 d.f. made up of pooled error and Treatments×years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. yield | 1420 | 1415 | 1669 | 1628 | 1795 |
| | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ |
| | 1897 | 1781 | 1683 | 1996 | 2009 |

C.D.=368·1 Kg/ha.

| | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | 1528 | 1657 | 2056 | 1899 | 2237 | 2270 | 2037 | 1794 | 2493 | 2435 | ** | 2041 | 312·5 |
| 1964 | 1312 | 1173 | 1282 | 1358 | 1354 | 1524 | 1524 | 1572 | 1499 | 1583 | N.S. | 1418 | 412·3 |
| Mean | 1420 | 1415 | 1669 | 1628 | 1795 | 1897 | 1781 | 1683 | 1996 | 2009 | N.S. | 1729 | 368·3 |

**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 61(161), 62(19), 63(9).**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'M'.**

Object :—To find out the effect of Lime on Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) Sandy loam. (iii) 16.8.61/NA ; N.A./30.7.62 ; 18.7.63/12.8.63. (iv) (a) 2 to 4 ploughings. (b) Transplanting. (c) N.A. (d) 23 cm.×23 cm. (e) 2 to 3. (v) Nil for 61(161) and 62(19). G.L. at 5604 Kg/ha. applied at first puddling, incorporated by ploughing in wet conditions. (vi) S. 661 (late). (vii) Irrigated. (viii) Hand weeding and passing Japanese weeder. (ix) 51 cms., 47 cm., 36 cm. (x) 18.12.61 ; 12.12.62 ; 21.12.63.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of lime : $L_0$=0, $L_1$=280 and $L_2$=560 Kg/ha.

(2) 2 levels of manures : $M_0$=0 and $M_1$=33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as super.

All fertilisers applied at planting

3. DESIGN:

(i) L. sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 9·2 m.×3·2 m., 9·1 m.×3·4 m., 8·5 m.×3·5 m. (b) 8·2 m.×2·7 M., 8·2 m × 2·5 m., 7·5 m×2·6 m. (v) 46 cm.×23 cm., 46 cm.×46 cm., 46 cm.×46 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. folidol sprayed as a precautionery measure. (iii) Yield of grain. (iv) (a) 1961—63. (b) No. (c) Results of combined analysis and presented under 5 Results. (v) Mangalore. Ponnempat. (vi) Nil. (vii) Error variances are heterogeneous, Treatments×years interaction is present.

5. RESULTS :

(i) 2482 Kg/ha. (ii) 982·0 Kg/ha. (based on 10 d.f. made up of Treatments×years interaction). (ii) Main effect of M is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $L_0$ | $L_1$ | $L_2$ | Mean |
|---|---|---|---|---|
| $M_1$ | 2082 | 2226 | 2211 | 2173 |
| $M_2$ | 2770 | 2694 | 2907 | 2790 |
| Mean | 2426 | 2460 | 2559 | 2482 |

C.D. for M marginal means=421·0 Kg/ha.

| Years | $L_0$ | $L_1$ | $L_2$ | Sig. | $M_1$ | $M_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|
| 1961 | 2694 | 2768 | 3064 | N.S. | 2165 | 3519 | ** | 2842 | 727·7 |
| 1962 | 2144 | 2086 | 2131 | * | 1932 | 2308 | * | 2120 | 398·3 |
| 1963 | 2441 | 2526 | 2484 | N.S. | 2423 | 2544 | N.S. | 2484 | 314·0 |
| Pooled | 2426 | 2460 | 2559 | N.S. | 2173 | 2790 | ** | 2482 | 982·0 |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 64(104), 65(25).**
**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'M'.**

Object :—To study the effect of foliar spray of urea on the growth and yield of Paddy.

### 1. BASAL CONDITIONS :

(i) (a) Paddy, Paddy. (b) G.M. at 56 Q/ha., Paddy. (c) 33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ ; N.A. (ii) Red loam. (iii) 28.7.64/29.8.64 ; 26.7.65/31.8,65. (iv) (a) Ploughings and puddling. (b) Transplanting. (c) 22 Kg/ha., 49 Kg/ha. (d) 23 cm.×23 cm.. 20 cm.×20 cm. (e) 3. (v) Nil. (vi) S 1092 (late). (vii) Irrigated. (viii) Hand weeding and passing Japanese paddy cultivator. (ix) 57 cm., 27·7 cm. (x) 7.1.65 ; 8.1.96.

### 2. TREATMENTS :

5 manurial treatments : $T_0$=Control, $T_1$=Soil application of 33·6 Kg/ha. of N as A/S at planting $T_2$= Soil application of 33·6 Kg/ha. of N as urea at planting, $T_3$=Foliar spray of 16·8 Kg/ha. N as urea and $T_4$=Foliar spray of 33·6 Kg/ha. of N as urea.

### 3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5 ; 4. (iv) (a) 6·1 m.×3·1 m., N.A. (b) 5·2 m.×2·2 m., 6·1 m.× 3·0 m. (v) 46 cm.×46 cm., N.A. (vi) Yes.

### 4. GENERAL

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964—65. No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent.

### 5. RESULTS :

64(104)

(i) 2037 Kg/ha. (ii) 580·0 Kg/ha. (ii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Mean yield | 1883 | 2104 | 2473 | 1698 | 2028 |

65(25)

(i) 1464 Kg/ha. (ii) 268·1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Mean yield | 1144 | 1601 | 1601 | 1386 | 1588 |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 60(77)**
**Site :- Agri. Res. Stn., Nagerhally.** **Type :- 'M'.**

Object :—To find out the effects of different G.M. on the yield Paddy.

### 1. BASAL CONDITIONS:

(i) (a) Paddy -paddy. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) 20-6-60. (iv) (a) 2 ploughings. (b) Transplanting. (c) 18 Kg/ha. (d) 25 cm.×23 cm. (e) 2 to 3. (v) Nil. (iv) S.R. 26 B. (vii) Irrigated. (viii) Passing Japanese weeder and hand weeding. (ix) 33 cm. (x) 22-11-60.

### 3. TREATMENTS:

7 green manurial treatments : $T_0$=Control, $T_1$=Sesbania, $T_2$=Honge leaf, $T_3$=Glyricidia, $T_4$=Sannhemp, $T_5$=Cowpea, and $T_6$=Horse gram
G.M. applied at 6725 Kg/ha.

### 3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 1/247·10 ha. (b) 6·4 m.×3·1 m. (v) and (vi) Yes.

4. GENERAL :

(i) Good. (ii) Attack of stem borer folidol was sprayed. (iii) Grain yield. (iv) (a) 1959 –61 (modified in 1961). (b) Yes. (c) N.A. (iv) (a) N.A. (b) Nil. (vi) Spell of draught during July and August 1960. (vii) Nil.

5. RESULTS :

(i) 3512 Kg/ha. (ii) 381·1 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 2558 | 3138 | 4185 | 4069 | 3255 | 3952 | 3429 |

C.D.=566·2 Kg/ha.

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 61(158).**

**Site :- Agri. Res. Stn., Nagenahally.** **Type :- 'M'.**

Object :— To find the effects of G.M. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy after Paddy. (b) Paddy. (c) As per treatments. (ii) Sandy loam. (iii) 18.7.61/17.8.61. (iv) (a) 2 ploughings. (b) Transplanting. (c) 18 Kg/ha. (d) 25 cm.×23 cm. (e) 2 to 3. (v) Nil. (vi) S.R. 26 B. (vii) Irrigated. (viii) Passing Japanese weeder and hand weeding. (ix) 51 cm. (x) 18.12.61.

2. TREATMENTS :

7 G.M. crops : $T_0$=Control, $T_1$=Sesbania, $T_2$=Honge leaf, $T_3$=Glyricidia, $T_4$=Sunnhemp, $T_5$=Cowpea and $T_6$=Horse gram.

G.M. applied at 56 Q/ha.

3. DESIGN

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 6·4 m.×3·0 m. (v) and (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1959-61 (modified in 1961). (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 3860 Kg/ha. (ii) 599·4 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 2689 | 3458 | 4226 | 4482 | 3714 | 3842 | 4611 |

C.D.=890·6 Kg/ha.

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**Crop :- Paddy (*Kharif*)** **Ref :- Ms. 60(75).**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'M'.**

Object :— To find the optimum combination of N, P and K for Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) As per treatments. (ii) Sandy loam. (iii) 20.6.60. (iv) (a) 4 ploughings. (b) Transplanting. (c) 18 Kg/ha. (d) 25 cm. × 23 cm. (e) 2 to 3. (v) G.M. at 5600 Kg/ha.+Compost at 5600 Kg/ha. (vi) 3-701 ($5\frac{1}{2}$) months. (vii) Irrigated. (viii) Passing Japanese weeder and hand weeding. (ix) 33 cm. (x) 2.12.60.

2. TREATMENTS :

All combinations of (1), (2) and (3).

(1) 3 levels af N as A/s : $N_0=0$, $N_1=33{\cdot}6$ and $N_2=67{\cdot}2$ Kg/ha.

(2) 3 levels of $P_2O_5$ as Super : $P_0=0$, $P_1=33{\cdot}6$ and $P_2=67{\cdot}2$ Kg/ha.

(3) 3 levels of $K_2O$ as Mur. Pot. : $K_0=0$, $K_1=33{\cdot}6$ and $K_2=67{\cdot}2$ Kg/ha.

N applied in to doses at planting and 40 days after planting P and K applied in one dose at planting.

3. DESIGN :

(i) $3^3$ Confd. (ii) (a) 9 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 1/164·7 ha. (b) 9·1 m. × 3 0 m. (v) and (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Attack of stem borer, folidol was sprayed. (iii) Grain yield. (iv) (a) 1957-1960. (b) Yes. (c) Nil. (v) (a) Magad and Mangalore. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 4171 Kg/ha. (ii) 569·9 Kg/ha. (iii) Main effect of N is highly significant and that of P is significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 3526 | 3824 | 3553 | 3553 | 3906 | 3444 | 3634 |
| $N_1$ | 3987 | 4312 | 4422 | 4584 | 4095 | 4042 | 4240 |
| $N_2$ | 4041 | 4532 | 5343 | 4829 | 4286 | 4801 | 4639 |
| Mean | 3851 | 4223 | 4439 | 4322 | 4096 | 4096 | 4171 |
| $K_0$ | 4015 | 4204 | 4747 | | | | |
| $K_1$ | 3688 | 4422 | 4147 | | | | |
| $K_2$ | 3851 | 4042 | 4394 | | | | |

C.D. for N or P marginal means=394·0 Kg/ha.

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 60(74).**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'M'.**

Object :— To find the merits of different Nitrogeneous fertilizers.

1. BASAL CONDITIONS :

(i) (a) Paddy followed by Paddy with an intervening green manure crop. (b) Paddy. (c) As per treatments. (ii) Sandy loam soil. (iii) 25.7.60. (iv) (a) 4 ploughings. (b) Transplanting. (c) —. (d) 25 cm. × 23 cm. (e) 2 to 3. (v) G.M. at 5604 Kg/ha. (vi) S-701. (vii) Irrigated. (viii) 2 weedings by Japanese weeder and 2 hand weedings. (ix) 33 cm. (x) 9.12.60.

2. TREATMENT :

7 Sources of 33·6 Kg/ha. of N : $S_0$=0, $S_1$=A/S, $S_2$=C/A/N, $S_3$=A/C, $S_4$=Urea, $S_5$=A/S/N and $S_6$=C/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 1/164·7 ha. (b) 9·1 m.×3·0 m. (v) and (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Case worm and stem borer mild attack conrolled by spraying folidol. (iii) Grain yield. (iv) (a) 1958-1960. (b) No. (c) Nil. (v) (a) Mugad and Mangalore. (b) N.A. (vi) Long spells of draught during, July, August, 60. (vii) Nil.

5. RESULTS :

(i) 3388 Kg/ha. (ii) 635·3 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 2287 | 3865 | 3458 | 3621 | 3255 | 3702 | 3580 |

C.D.=944·0 Kg/ha.

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 60(76).**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'M'.**

Object :— To compare the relative merits of complexal, A/S and other fertilizers and to find the suitable time of application.

1. BASAL CONDITIONS:

(i) (a) Paddy-Paddy. (b) Paddy. (c) As per treatments. (ii) Sandy loam. (iii) 20.6.60. (iv) (a) 4 ploughings. (b) Transplanting. (c) 18 Kg/ha. (d) 25 cm.×23 cm. (e) —. (v) G.M. at 5604 Kg/ha.+compost at 5604 Kg/ha. (vi) S-701. (vii) Irrigated. (viii) Passing Japanese weeder and hand weeding. (ix) 33 cm. (x) 9.12.60.

2. TREATMENTS :

8 manurial treatments : $T_0$=Control, $T_1$=168·1 Kg/ha. of complesal at planting, $T_2$=168·1 Kg/ha. of complesal, half at planting+half one month after planting, $T_3$=168·1 Kg/ha. of A/S at planting, $T_4$=168·1 Kg/ha. of A/S, half and planting+half one month after planting, $T_5$=84·0 Kg/ha. of A/S at planting+112·1 Kg/ha. of C/N one month after planting, $T_6$=84·0 Kg/ha. of A/S+84·0 Kg/ha. of C/A/N at planting and $T_7$=168·1 Kg/ha. of A/S+201·8 Kg/ha. of Super, half at planting+half one month after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 1/164·7 ha. (b) 9·1 m.×3·0 m. (v) and (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Stem borer-folidol was sprayed. (iii) Grain yield. (iv) (a) 1958-1960. (b) Yes. (c) Nil. (v) (a) Mangalore and Mugad. (b) Nil. (vi) Long spell of draught during July and August 1960. (vii) Nil.

5. RESULTS :

(i) 3744 Kg/ha. (ii) 388·6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 3092 | 3784 | 3824 | 3744 | 3906 | 3734 | 3702 | 4151 |

**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 62(14).**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'M'.**

Object :—To find out the best time of application of N for Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy—G.M. (b) G.M. (c) 22·4 Kg/ha. of $P_2O_5$ applied at the time of green manure sowing. (ii) Sandy loam. (iii) 11·7.1962/14.8.1962. (iv) (a) 4 ploughings. (b) Transplanting. (c) – . (d) 23 cm.×23 cm. (e) 2 to 3. (v) 725 Kg/ha. of G.M.+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of N. (vii) S R.26.B (medium). (viii) Irrigated. (viii) 2 weedings, (ix) 37 cm, (x) 23.11.1962.

2. TREATMENTS :

4 times of application of 22·4 Kg/ha. of N as top-dressing : $T_1$=15—20 days after transplanting, $T_2$=33 days before heading, $T_3$=18 days before heading and $T_4$=Before flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 9·1 m.×13·8 m. (iii) 9. (iv) (a) 9·1 m.×3·4 m. (b) 8·2 m.×2·5 m. (v) 46 cm.×46 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil—spraying of folidol was taken as a precautionary measure. (iii) Yield of grain. (iv) (a) 1962 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2832 Kg/ha. (ii) 428·3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 2866 | 3094 | 2802 | 2562 |

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**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 64(11), 65(21).**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'M'.**

Object :—To study the effect of different Phosphatic Fertilisers on Paddy in comparison with super.

1. BASAL CONDITIONS :

(i) (a) Paddy paddy. (b) Paddy. (c) 56 Q/ha. of F.Y.M.+33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as super for 64(11), 56 Q/ha. of G.M. for 65(21). (ii) Sandy loam. (iii) 5.7.64/17, 18.8.64 ; 11.8.65/10.9.65 (iv) (a) 3 ploughings and puddling. (b) Transplanting. (c) —. (d) 25 cm.×23 cm ; 20 cm.×20 cm. (e) N.A. (v) 56 Q/ha. of G.M. (vi) B.741 (late) ; V 749 (late). (vii) Irrigated. (viii) Weeding. (ix) 55 cm. ; 24·8 cm. (x) 4.1.65 ; 3.1.66.

2. TREATMENTS :

All combinations of (1) and (2)+2 extra treatments

(1) 8 sources of $P_2O_5$ : $S_1$=Super, $S_2$=Rock. Phos. (100 mesh), $S_3$=Rock Phos. (300 mesh), $S_4$=Thomas slag, $S_5$=Fused Mg. Phos., $S_6$=Steamed bone meal, $S_7$=Nitrophos. (ODDA) and $S_8$=Nitrophos. (PEC).

(2) 2 levels of $P_2O_5$ : $P_1$=37·1 and $P_2$=74·1 Kg/ha.

$E_0$=Control (3 plots) and $E_1$=49·4 Kg/ha. of N as A/S

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 3. (iv) 7·3 m.×7·3 m. (b) 6·3 m.×6·3 m. (v) and (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of thrips, stem borer and blast combined spray of blitox and folidol for 55(21). (iii) Yield of grain. (iv) (a) 1964—65. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and treatments×years interaction is absent.

5. RESULTS :

**64(11)**

(i) 3421 Kg/ha. (ii) 626·6 Kg/ha. (iii) Main effect of S is significant $E_0$ Vs. $E_1$ is highly significant. (iv) Av. yield of grain in Kg/ha.

$E_0$=2774 and $E_1$=4226 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | $S_7$ | $S_8$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $P_1$ | 3778 | 4162 | 3885 | 4077 | 3010 | 3479 | 3970 | 2583 | 3618 |
| $P_2$ | 4077 | 3650 | 2753 | 2732 | 3266 | 3778 | 3629 | 3052 | 3367 |
| Mean | 3927 | 3906 | 3319 | 3404 | 3138 | 3628 | 3799 | 2817 | 3492 |

C.D. for S marginal means=732·4 Kg/ha.
C.D. for $E_0$ Vs. $E_1$ =845·8 Kg/ha.

**65(21)**

(i) 2257 Kg/ha. (ii) 393·2 Kg/ha. (iii) Main effect of S and $E_0$ Vs. $E_1$ are significant. (iv) Av. yield of grain in Kg/ha.

$E_0$=1929 and $E_1$=2553 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | $S_7$ | $S_8$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $P_1$ | 2092 | 2655 | 2698 | 2621 | 2459 | 2220 | 2331 | 1784 | 2357 |
| $P_2$ | 2314 | 2570 | 2698 | 2100 | 2040 | 2271 | 1912 | 2032 | 2242 |
| Mean | 2203 | 2612 | 2698 | 2360 | 2249 | 2245 | 2121 | 1908 | 2300 |

C.D. for S marginal means=459·6 Kg/ha.
C.D. for $E_0$ vs. $E_1$ =530·8 Kg/ha.

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**Crop :- Paddy.** **Ref :- Ms. 62(176), 63(175), 64(130).**

**Site :- Agri. Res. Stn., Pannampet.** **Type :- 'M'.**

Object :— To find out the optimum doses of N, P and K for Paddy under local conditions.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) As per treatments. (ii) Sandy loam. (iii) 4.6.62 for 62 ; N.A. for others. (iv) (a) Ploughing, puddling and levelling. (b) Transplanting. (c) 448 Kg/ha. mursey. (d) 23 cm.×23 cm. (e) 2. (v) 22·5 C.L./ha. of F.Y.M. at planting. (vi) Andrew Sail (medium). (vii) Unirrigated. (viii) 3 weedings. (ix) 286 cm. (x) 27.11.62 ; N.A. for others.

2. TREATMENTS :

All combinations of (1), (2) and (3).

(1) 2 levels of N : $N_1$=33·6 and $N_2$=67·2 Kg/ha.
(2) 3 levels of $P_2O_5$ : $P_0$=0, $P_1$=33·6 and $P_2$=67·2 Kg/ha.
(3) 3 levels of $K_2O$ : $K_0$=0, $K_1$=33·6 and $K_2$=67·2 Kg/ha.

3. DESIGN :

(i) $3^2 \times 2$ Fact. confd. (ii) (a) 6 plots/block ; 3 blocks/replication. (b) 14·6 m.×23·8 m. (iii) 4. (iv) (a) 4·9 m.×4·0 m. (b) 4·6 m.×3·7 m. (v) 15 cm.×15 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962-1964 (modified in 65). (b) Yes. (c) Results of combined analysis given under 5. (v) N.A. (vi) Nil. (vii) Error variance are heterogeneous and interaction of treatments in the N×P, N×K table with years are present and in the table P×K with years is absent.

5. RESULTS :

(i) 2023 Kg/ha. (ii) 381·7 Kg/ha. (18 d.f. made up interaction of treatments components N,P,K, N×P, N×K with years) (iii) Main effect of N is highly significant and that of P is significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 1853 | 1984 | 2001 | 1936 | 1941 | 1961 | 1946 |
| $N_2$ | 1998 | 2182 | 2122 | 2100 | 2152 | 2050 | 2101 |
| Mean | 1925 | 2083 | 2062 | 2018 | 2046 | 2005 | 2023 |

62(176)

| | $P_0$ | $P_1$ | $P_2$ | Mean |
|---|---|---|---|---|
| $K_0$ | 3325 | 3392 | 3258 | 3325 |
| $K_1$ | 3053 | 3732 | 3598 | 3461 |
| $K_2$ | 3120 | 3325 | 3392 | 3279 |
| Mean | 3166 | 3483 | 3416 | 3355 |

S.E. of P or K marginal means=82·2 Kg/ha.

63(175)

| | $P_0$ | $P_1$ | $P_2$ | Mean |
|---|---|---|---|---|
| $K_0$ | 2209 | 2440 | 2476 | 2375 |
| $K_1$ | 2356 | 2468 | 2310 | 2378 |
| $K_2$ | 2332 | 2436 | 2483 | 2417 |
| Mean | 2299 | 2448 | 2423 | 2390 |

S.E of P or K marginal means=83·6 Kg/ha.

64(130)

| | $P_0$ | $P_1$ | $P_2$ | Mean |
|---|---|---|---|---|
| $K_0$ | 353 | 267 | 445 | 355 |
| $K_1$ | 222 | 378 | 300 | 300 |
| $K_2$ | 358 | 309 | 298 | 320 |
| Mean | 311 | 318 | 346 | 325 |

S.E. of P or K marginal means=28·9 Kg/ha.

| Years | $N_1$ | $N_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|
| 1962 | 3182 | 3528 | ** | 3355 | 402·8 |
| 1963 | 2328 | 2452 | N.S. | 2390 | 409·7 |
| 1964 | 328 | 322 | N.S. | 325 | 141·6 |
| Pooled | 1946 | 2101 | ** | 2023 | 381·7 |

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**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 61(197), 62(178).**

**Site :- Agri. Res. Stn., Ponnampet.** **Type :- 'M'.**

Object :— To compare the efficacy of nitrophosphate processed by O.D.D.A. and P.E.C. process.

1. BASAL CONDITIONS :

(i) (a) Paddy after Paddy. (b) Paddy. (c) 22·5 C.L./ha. of F.Y.M.+2800 Kg/ha. of G.M.+168 Kg/ha. of A/S+168 Kg/ha. of Super. (ii) Sandy clay. (iii) 20.6.61/10.8.61 ; 4.6.62/5.7.62' (iv) (a) Digging, levelling and ploughing. (b) Transplanting. (c) 448 Kg/ha. (d) 23 cm.×23 cm. (e) 2. (v) 22·5 C.L./ha. of F.Y.M. (vi) K.B. 356. (vii) Unirrigated. (viii) 3 weedings (ix) 379 cm. ; 286 cm. (x) 30.12.61 ; 25.12.62.

2. TREATMENTS :

All combinations of (1), (2) and (3)+4 extra treatments in each block.

(1) 3 levels of fertilizers : $P_1$=Super, $P_2$=Nitrophosphate ODDA and $P_3$=Nitrophosphate PEC.

(2) 3 levels of N and P : $L_1=13·4$ Kg/ha. of N+11·8 Kg/ha. of $P_2O_5$, $L_2=2\ L_1$ and $L_3=4\ L_1$

(3) 3 methods of application : $M_1$=Broadcast. $M_2$=Roots of seedlings dipped in slush and $M_3$=Pallet application.

$T_0=0$, $T_1=13·4$ $T_2=26·8$ and $T_3=53·6$ Kg/ha. of N in each block.

3. DESIGN :

(i) $3^3+4$ confd. (ii) (a) 13 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) 3·7 m.×3·7 m. (b) 3·4 m.×3·4 m. (v) 15 cm.×15 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Grain spot (mild) folidol sprayed. (iii) Yield of grain. (iv) 1961-1962. (b) Yes- (c) Results of combined analysis given under 5. (v) and (vi) Nil. (vii) Error variance are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 2205 Kg/ha. (ii) 465·4 Kg/ha. (based on 106 d.f. made up of pooled error and interaction of various components of Treatments×years. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$T_0=2125$, $T_1=2382$, $T_2=2256$ and $T_3=2344$ Kg/ha.

|  | $L_1$ | $L_2$ | $L_3$ | $P_1$ | $P_2$ | $P_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $M_1$ | 2226 | 2150 | 2184 | 2057 | 2348 | 2154 | 2187 |
| $M_2$ | 2155 | 2096 | 2247 | 1991 | 2171 | 2336 | 2166 |
| $M_3$ | 2256 | 2007 | 2239 | 2095 | 2272 | 2133 | 2167 |
| Mean | 2212 | 2084 | 2223 | 2048 | 2264 | 2208 | 2173 |
| $P_1$ | 2259 | 1974 | 1910 |  |  |  |  |
| $P_2$ | 2306 | 2129 | 2356 |  |  |  |  |
| $P_3$ | 2071 | 2150 | 2403 |  |  |  |  |

|  | $M_1$ | $M_2$ | $M_3$ | Sig. | $L_1$ | $L_2$ | $L_3$ | Sig. | $P_1$ | $P_2$ | $P_3$ | Sig. | $T_0$ | $T_1$ | $T_2$ | $T_3$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1961 | 2569 | 2502 | 2631 | N.S. | 2477 | 2516 | 2710 | N.S. | 2463 | 2597 | 2643 | N.S. | 2465 | 2853 | 2356 | 2802 | N.S. | 2584 | 401·9 |
| 1962 | 1804 | 1830 | 1703 | N.S. | 1947 | 1653 | 1737 | N.S. | 1633 | 1930 | 1773 | N.S. | 1785 | 1911 | 2155 | 1886 | N.S. | 1827 | 508·9 |
| Pooled | 2187 | 2166 | 2167 | N.S. | 2212 | 2084 | 2223 | N.S. | 2048 | 2264 | 2208 | N.S. | 2125 | 2382 | 2256 | 2344 | N.S. | 2205 | 465·4 |

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**Crop :- Paddy** *(Kharif)*. **Ref :- Ms. 62(177), 63(176), 64(131), 65(6).**

**Site :- Agri. Res. Stn,, Ponnampet. Type :- 'M'.**

Object : — To study the efficacy of coffee husk as manure for Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy after Paddy. (b) Paddy. (c) Nil. (ii) Sandy loam. (iii) 25.5.62/11.7.62 ; 12.6.63/8.8.63 ; 30.6.64/28.7.64 ; N.A./13.7.65. (iv) (a) 2 dry ploughings and 2 diggings. (b) 40 days old seedlings transplanted. (c) 448 Kg/ha. for nursery. (d) 23 cm.×23 cm. (e) 2. (v) Nil. (vi) K.B. 356 (late). (vii) Unirrigated. (viii) 3 hand weedings. (ix) 286 cm. ; 191 cm. ; 322 cm. 149 cm. (x) 5.12.62 ; 24.12.63 ; 8,1.65 ; 22.12.65.

2. TREATMENTS :

3 manurial treatments : $T_0$=Control, $T_1$=Coffee husk to supply 33·6 Kg/ha. of N+11·8 Kg/ha. of $P_2O_5$+ 42 Kg/ha. of $K_2O$ and $T_2$=33·6 Kg/ha. of N as A/S+11·8 Kg/ha. of $P_2O_5$ as super +42 Kg/ha. of $K_2O$ as Mur. Pot.

3. DESIGN :

(i) R.B D, (ii) (a) 3. (b) 20·6 m.×6·9 m. (iii) 6. (iv) (a) 6·9 m.×6·9 m. (b) 6·4 m.×6·4 m. (v) 23 cm.×23 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil for 63 (197). Severe attack of helminthosporium. Sprayed bordeux mixture once after flowering for 63 (176). Slight neck infection sprayed with blitox solution for 64, 65. (iii) Grain yield, (iv) (a) 1962-1965. (b) Yes. (c) Nil. (v) anp (vi) Nil. (vii) Error variance are heterogeneous and Treatments×years interaction is absent.

5. RESULTS :

**62(177)**

(i) 4542 Kg/ha. (ii) 775·9 Kg/ha. (iii) Treatment difference are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ |
|---|---|---|---|
| Av. yield | 4595 | 4310 | 4721 |

63(176)

(i) 3569 Kg/ha. (ii) 673·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ |
|---|---|---|---|
| Av. yield | 3607 | 3530 | 3570 |

**64(131)**

(i) 3527 Kg/ha. (iii) 483·1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ |
|---|---|---|---|
| Av. yield | 3310 | 3489 | 3782 |

**65(6)**

(i) 1345 Kg/ha. (ii) 251·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ |
|---|---|---|---|
| Av. yield | 1209 | 1355 | 1470 |

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**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 64(132), 65(9).**

**Site :- Agri. Res., Ponnampet.** **Type :- 'M'.**

Object :— To study the effect of Lime on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy, (c) 22·5 C.L./ha. of F.Y.M.+280 Kg/ha. of G.M.+168 Kg/ha. of A/S +224 Kg/ha. of Super for 64 (132). As per tratments for 65 (9). (ii) Sandy loam. (iii) 30.6.64/27.7.64 ; 11.6.65/20.7.65. (iv) (a) 2 deep ploughings, 2 diggings and levelling. (b) Transplanting. (c) 45 Kg/ha. (d) 23 cm.×23 cm. (e) 2. (v) Nil ; 22 C.L./ha. of F.Y.M. (vii) K.B. 356 (late). (vii) Unirrigaed (viii) 2 hand weedings. (ix) 222 cm. ; 149·4 cm. (x) 3.1.65 ; 23.12.65.

2. TREATMENTS :

6 manurial treatments : $T_0$=No manure, $T_1$=280 Kg/ha. of lime, $T_2$=560 Kg/ha. of lime, $T_3$=280 Kg/ha. of lime+33·6 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$, $T_4$=560 Kg/ha. of lime+33·6 33·6 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$ and $T_5$=33·6 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 41·1 m.×4·1 m. (iii) 3. (iv) (a) 6·9 m.×4·1 m. (b) 6·4 m.×3·7 m. (v) 23 cm. ×23 cm. (vi) Yes.

4. GENERAL :

(i) Slight lodging. (ii) Heavy blast and neck infection in 64 (132). Mitox and cosan syrayed in 65 (9). (iii) Plant ht. and yield and of grain. (iv) (a) 1964-1966. (b) Yes. (c) Nil. (v) and (vi) Nil.

5. RESULTS :

**64(132)**

(i) 2961 Kg/ha. (ii) 610·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 2350 | 2543 | 3460 | 2563 | 3266 | 3582 |

**65(9)**

(i) 1912 Kg/ha. (ii) 273·6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grrin iu Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1582 | 1925 | 2037 | 1808 | 2113 | 2006 |

**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 60(192), 61(196).**

**Site :- Agri. Res. Stn., Ponnampet.** **Type :- 'M'.**

Object :—To study the effect of different nitrogenous fertilizers on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Sandy clay. (iii) 31.5.60/3.8.60 ; 6.6.61/5.8.61. (iv) (a) 4 ploughings and levelling. (b) Transplanting. (c) 45 Kg/ha. for nursery sowing. (d) 23 cm.×23 cm. (e) 2. (v) 22·5 C.L./ha. of F.Y.M.+2800 Kg/ha. of G.M. (vi) K.B. 356 (late). (vii) Unirrigated, (viii) 3 hand weedings. (ix) 183 cm. ; 379 cm. (x) 30.12.60 ; 30.12.61.

2. TREATMENTS :

6 sources of 33·6 Kg/ha. of N : $S_0$=Control, $S_1$=A/S, $S_2$=A/C, $S_3$=Urea, $S_4$=A/S/N and $S_5$=C/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 62·2 m.×5·3 m. (iii) 4. (iv) (a) 10·1 m.×5·0 m. (b) 9·8 m.×4·7 m. (v) 15 cm.×15 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Mild incidence of grain spot. (iii) Yield of grain. (iv) (a) 1959 to 1961, (modified in 1960). (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments× years interaction is absent.

5. RESULTS :

60 (192)

(i) 2320 K/ha. (ii) 539·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 2115 | 2263 | 2706 | 2558 | 1919 | 2361 |

61(196)

(i) 2146 Kg/ha. (ii) 211·5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1919 | 2066 | 2484 | 1869 | 2361 | 2177 |

C.D.=318·8 Kg/ha.

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**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 62(179), 64(133), 65(7).**

**Site :- Agri. Res. Stn., Ponnampet.** **Type :- 'M'.**

Object: —To study the effect of F.Y.M. on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 22·5 C.L/ha. of F.Y.M.+2800 Kg/ha. of G.M.+168 Kg/ha. of A/S +168 Kg/ha. of super for 62(179). As per treatments for 64(133) and 65(7). (ii) Sandy clay. (iii) 25-5-62/29-6-62 ; 2-6-64/13-7-64 ; 19-6-65/26-7-65. (iv) (a) 2 ploughings and two diggings. (b) Transplanting. (c) 45 Kg/ha. (for nursery). (d) 23 cm.×23 cm. for 62(179) and 64(133) ; 25 cm.×25 cm. for 65(7). (e) 2 for 62(179) and 64(133) ; 3 to 4 65(7). (v) Nil. (vi) S 67. (vii) Unirrigated. (viii) 3 hand weedings for 62(179) and 64(133) 2 hand weedings and passing cultivator for 65(7). (iv) 286 cm. ; 322 cm. ; 149 cm. (x) 5-12-62 ; 22-11-64 ; 19-12.65.

2. TREATMENTS :

10 manurial treatments : $T_0$=No manure, $T_1$=20 C.L/ha. of F.Y.M., $T_2$=Inorganic manure equivalent to 20 C.L./ha. of F.Y.M., $T_3$=20 C.L./ha. of F.Y.M.+33·6 Kg/ha. NPK as inorganic manure, $T_4$=NPK equivalent to 20 C.L./ha. of F.Y.M.+33·6 Kg/ha. NPK as inorganic manure, $T_5$=10 C.L./ha. of F.Y.M.+NPK equivalent to 10 C.L./ha. of F.Y.M.+33·6 Kg/ha. of NPK as inorganic manure, $T_6$=5 C.L./ha. of F.Y.M.+NPK equivalent to 15 C.L./ha. of F.Y.M.+33·6 Kg/ha. of NPK as inorganic manure, $T_7$=33·6 Kg/ha. NPK as inorganic manure, $T_8$=NPK equivalent to 5600 Kg/ha. of G.M.+33·6 Kg/ha. of NPK as inorganic manure and $T_9$=5600 Kg/ha. ofG.M.+33·6 Kg/ha of NPK as inorganic manure.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) 7·0 m.× 51·8 m. for 62(179) and 64(133), 63·6 m.× 5·4 m. for 65(7). (iii) 3 (iv) (a) 7·0 m.× 5·2 m for 62(179) and 64(133) ; 6·4 m.× 5·7 m. for 65(7). (b) 6·4 m.× 4·6 m. for 62(179) and 64(133), 6 m.× 5 m. for 65(7). (v) and. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Leaf blast noticed-sprayed with copper fungicide. (iii) Yield of grain. (iv) (a) 1962—1965 (failed in 1963). (b) No. (c) Results of combined analysis are presented under 5 Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is present.

5. RESULTS :

(i) 1615 Kg/ha. (i)) 598·4 Kg/ha. (based on 18 d.f. made up of Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Mean yield | 1791 | 2047 | 1334 | 1786 | 1296 | 1668 | 1629 | 1754 | 1335 | 1508 |

| Years | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | 2092 | 1937 | 1085 | 1472 | 930 | 1239 | 1575 | 1549 | 930 | 775 | ** | 1358 | 387·3 |
| 1964 | 1554 | 2045 | 744 | 1580 | 790 | 1431 | 1420 | 1761 | 1250 | 1245 | * | 1382 | 371·8 |
| 1965 | 1728 | 2160 | 2172 | 2306 | 2169 | 2334 | 1891 | 1951 | 1824 | 2504 | N.S. | 2104 | 317·0 |
| Pooled | 1791 | 2047 | 1334 | 1786 | 1296 | 1668 | 1629 | 1754 | 1335 | 1508 | N.S. | 1615 | 598·4 |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 65(8).**

**Site : Agri. Res. Stn., Ponnampet.** **Type :- 'M'.**

Object :—To find out the optimum dose of NPK for Paddy under long condition.

1. BASAL CONDITION :

(i) (a) Paddy—Paddy. (b) Paddy. (c) As per treatments. (ii) Sandy loam. (iii) 29-6-65/2-8-65. (iv) (a) 2 ploughings and 2 diggings. (b) Transplanting. (c) —. (d) 25 cm.× 25 cm. (e) 3 to 4. (v) 22.2. C.L./ha. of F.Y.M. (vi) Andrew soil. (vii) Rainfed. (viii) 2 hand weedings. (ix) 149·4 cm. (x) 7.12.65.

2. TREATMENTS :

15 manurial treatments : $T_0$=Control (no manure) $T_1$=33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$, $T_2$=44·8 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+33·6 Kg/ha. of $K_2O$, $T_3$=50·4 Kg/ha. of N+39·2 Kg/ha. of $P_2O_5$+39·2 Kg/ha. of $K_2O$, $T_4$=56·0 Kg/ha. N+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$, $T_5$=61·6 Kg/ha. of N+50·4 Kg/ha. of $P_2O_5$+50·4 Kg/ha. of $K_2O$, $T_6$=67·2 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$, $T_7$=67·2 Kg/ha. of N+50·4 Kg/ha. of $P_2O_5$+50·4 Kg/ha. of $K_2O$, $T_8$=67·2 Kg/ha. of N+56·0 Kg/ha. of $P_2O_5$+56·0 Kg/ha. of $K_2O$, $T_9$=67·2 Kg/ha. of N+61·6 Kg/ha. of $P_2O_5$+61·6 Kg/ha. of $K_2O$, $T_{10}$=44·8 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$, $T_{11}$=50·4 Kg/ha. of N+50·4 Kg/ha. of $P_2O_5$+50·4 Kg/ha. of $K_2O$, $T_{12}$=56·0 Kg/ha. of N+56·0 Kg/ha. of $P_2O_5$+56·0 Kg/ha. of $K_2O$, $T_{13}$=61·6 Kg/ha. of N+61·6 Kg/ha. of $P_2O_5$+61·6 Kg/ha. of $K_2O$ and $T_{14}$=67·2 Kg/ha. of N+67·2 Kg/ha. of $P_2O_5$+67·2 Kg/ha. of $K_2O$.

3. DESIGN

(i) R.B.D. (ii) (a) 15. (b) 43·9 m.×10·8 m. (iii) 2. (iv) (a) 10·4 m.×2·9 m. (b) 10·0 m.×2·5 m. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Severe neck infection noticed. Blast—Blotox and Gosan sprayed to control blast. (iii) Yield af grain. (iv) (a) 1965. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 2901 Kg/ha. (ii) 1050 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatments | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Mean yield | 3512 | 3026 | 2824 | 3408 | 3006 | 2814 | 2236 | 3206 |
|  | $T_8$ | $T_9$ | $T_{10}$ | $T_{11}$ | $T_{12}$ | $T_{13}$ | $T_{14}$ |  |
|  | 2956 | 2034 | 3340 | 2670 | 3122 | 2942 | 2420 |  |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 62(285), 63(220), 64(186), 65(110).**

**Site :- Agri. Res. Stn., Sirsi.** **Type :- 'M'.**

Object :—Organic vs. inorganic manurial trial.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 12·4 C.L./ha. of F.Y.M.+33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (ii) Laterite soil and sandy loam. (iii) N.A. ; 7-8-63 ; 13-7-64 ; 30-7-65. (iv) (a) 4 ploughings with iron plough. (b) Line sowing. (c) N.A. (d) 20 cm.×20 cm. (e) 4 to 6. (v) 20 C.L./ha. of F.Y.M. by broadcast. (vi) T. 141(165days). (vii) Unirrigated. (viii) Weeding. (iv) N.A. ; 229 cm., 295 cm., 241 cm. (x) N.A. ; 4-12-63 ; 25-11-64 ; 25-11-65.

2. TREATMENTS :

10 manurial treatments : $T_0$=Control, $T_1$=20 C.L./ha. of F.Y.M., $T_2$=Inorganic manure equivalent to 20 C.L./ha. $T_3$=20 C.L./ha. of F.Y.M.+33·6 Kg/ha. NPK. as inorganic manure, $T_4$=NPK equivalent to 20 C.L./ha. of F.Y.M.+33.6 Kg/ha. of NPK as inorganic manure, $T_5$=10 C.L./ha. of F.Y.M.+NPK equivalent to 10 C.L./ha. of F.Y.M.+33·6 Kg/ha. of NPK as inorganic manure, $T_6$=5 C.L./ha. of F.Y.M+NPK equivalent to 15 C.L./ha. of F.Y.M.+33·6 Kg/ha. of NPK as inorganic manure, $T_7$=33·6 Kg/ha. NPK as inorganic manure, $T_8$=NPK equivalent to 5600 Kg/ha. as green manure+33·6 Kg/ha. of NPK as inorganic manure and $T_9$=5600 Kg/ha. of G.M. +33·6 Kg/ha. NPK as inorganic manure.

### 3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 7·6 m.×4·0 m. (b) 7·2 m.×3·6 m. (v) 21 cm.×20 cm. (vi) Yes.

### 4. GENERAL :

(i) Satisfactory. (ii) Nil, slightly attacked by blast, spraying with folidol in 65(110). (iii) Yield of grain. (iv) (a) 1962—1965. (b) No. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous and treatments×years interaction is present.

### 5. RESULTS :

(i) 3470 Kg/ha. (ii) 1740·3 Kg/ha.(based on 27 d.f. made up of treatments×years interaction) (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 2370 | 3020 | 3471 | 3494 | 4029 | 3544 | 4197 | 3504 | 3566 | 3508 |

| Years | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | 1205 | 1528 | 3071 | 2518 | 3718 | 2805 | 2796 | 2412 | 2892 | 2305 | ** | 2525 | 349·2 |
| 1963 | 2635 | 4284 | 1780 | 3424 | 4300 | 2919 | 4440 | 4238 | 2978 | 3115 | ** | 3411 | 591·0 |
| 1964 | 2787 | 3589 | 4371 | 4312 | 2859 | 4260 | 3975 | 3993 | 4148 | 4392 | ** | 3869 | 488·9 |
| 1965 | 2852 | 2680 | 4661 | 3722 | 5238 | 4193 | 5577 | 3372 | 4247 | 4220 | ** | 4076 | 321·6 |
| Pooled | 2370 | 3020 | 3471 | 3494 | 4029 | 3544 | 4197 | 3504 | 3566 | 3508 | N.S. | 3470 | 1740·3 |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 65(111).**

**Site :- Agri. Res. Stn., Sirsi.** **Type :- 'M'.**

Object :--To study the comparative merits of existing and new types of phosphatic fertilizers in the acidic soil regions.

### 1. BASAL CONDITIONS :

(i) (a) Paddy after Paddy. (b) Paddy. (c) 12·4 C.L./ha. of F.Y.M.+33·6 kg/ha. of N+22·4 kg/ha. of $P_2O_5$. (ii) Sandy loam of laterite soil. (iii) 6.8.65. (iv) (a) 4 ploughings and levellings. (b) Line planting. (c) N.A. (d) 20 cm.×20 cm. (e) 4 to 6. (v) Nil. (vi) T—141. (vii) Unirrigated. (viii) Interculturing and weeding. (ix) 24 cm. (x) 29.11.65.

### 2. TREATMENTS :

All combinations of (1) and (2)+2 extra treatments :

(1) 2 levels of $P_2O_5$ : $P_1$=37·1 and $P_2$=74·2 kg/ha.

(2) 8 sources of $P_2O_5$ : $S_1$=Super, $S_2$=Rock Phos. (100 mesh), $S_3$=Rock Phos. (300 mesh), $S_4$=Thomas slag, $S_5$=Fused Mg. Phos., $S_6$=Steamed bone meal, $S_7$=Multiflorinate Phos. and $S_8$=Deflorinated Phos.

$T_0$=Control and $T_1$=A/S at 49·4 kg/ha.

### 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 2. (iv) (a) and (b) 4·9 m×6·1 m. (v) Nil. (vi) Yes.

### 4. GENERAL :

(i) Good. (ii) Slightly attacked by blast. Spraying with folidol. (iii) Yield of grain. (iv) (a) to (c) No. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3154 kg/ha. (ii) 570·6 kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in kg/ha.

$T_0$=2847 and $T_1$=3246 kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | $S_7$ | $S_8$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $P_1$ | 2939 | 3191 | 2779 | 2863 | 3023 | 3913 | 2734 | 3443 | 3111 |
| $P_2$ | 2490 | 3712 | 3443 | 2368 | 3796 | 3334 | 3124 | 3527 | 3224 |
| Mean | 2715 | 3451 | 3111 | 2616 | 3409 | 3623 | 2929 | 3485 | 3167 |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 60(91), 61(73).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'M'.**

Object :—To find out the optimum dose of N, P and K fertilizers for the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 125·5 Q/ha. of F.Y.M.+5604 kg/ha. of G.L.+44·8 kg/ha. of N +44·8 kg/ha. of $P_2O_5$. (ii) Black cotton soil. (iii) 5.8.60 ; N.A. (iv) (a) 2 victory ploughings and levelling. (b) Transplanting. (c) N.A. (d) 23 cm.×23 cm. (e) 2. (v) 125·5 Q/ha. of F.Y.M. for 60(91) 7·41 C.L./ha. of F.Y.M.+5604 kg/ha. of G.M. for 61(73). (vi) G.E.B. 24 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 49 cm.; 32 cm. (x) 15 and 16.12.60 ; 19 and 20.12.61.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N : $N_0$=0, $N_1$=33·6 and $N_2$=67·2 kg/ha.
(2) 3 levels of $P_2O_5$ : $P_0$=0, $P_1$=33·6 and $P_2$=67·2 kg/ha.
(3) 3 levels of $K_2O$ : $K_0$=0, $K_1$=33·6 and $K_2$=67·2 kg/ha.

3. DESIGN :

(i) $3^3$ partially Confd. (ii) (a) 9 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 1/198 ha. (b) 1/247 ha. (v) Yes. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil ; seedlings dipped in Folidol for 61(73). (iii) Yield of grain. (iv) (a) 1960—1961. (b) No. (c) Results of combined analysis are given under 5. Results. (v) to (vii) Nil.

5. RESULTS :

(i) 3142 kg/ha. (ii) 563 0 kg/ha. [62 d.f. made up of pooled error and Treatments×years interaction]. (iii) Main effects of N is highly significant and that of P is significant. (iv) Av. yield of grain in kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 2472 | 2736 | 2764 | 2726 | 2742 | 2503 | 2657 |
| $N_1$ | 3109 | 3296 | 3434 | 3389 | 3081 | 3369 | 3280 |
| $N_2$ | 3198 | 3735 | 3535 | 3399 | 3488 | 3580 | 3489 |
| Mean | 2926 | 3256 | 3244 | 3172 | 3104 | 3151 | 3142 |
| $K_0$ | 2885 | 3165 | 3466 | | | | |
| $K_1$ | 3082 | 3214 | 30 5 | | | | |
| $K_2$ | 2811 | 3389 | 3252 | | | | |

C.D. for N or P marginal means=265·4 Kg/ha.

| Years | $N_0$ | $N_1$ | $N_2$ | Sig. | $P_0$ | $P_1$ | $P_2$ | Sig. | $K_0$ | $K_1$ | $K_2$ | Sig. | G. M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 2276 | 2895 | 3091 | ** | 2587 | 2886 | 2790 | N.S. | 2896 | 2565 | 2802 | N.S. | 2754 | 653·1 |
| 1961 | 3038 | 3664 | 3888 | ** | 3266 | 3625 | 3699 | N.S. | 3448 | 3643 | 3500 | N.S. | 3530 | 506·6 |
| Pooled | 2657 | 3280 | 3489 | ** | 2926 | 3256 | 3244 | * | 3172 | 3104 | 3151 | N.S. | 3142 | 563·0 |

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**Crop :- Paddy.** **Ref :- Ms. 61(260), 62(261), 63(40).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'M'.**

Object :—To test the efficiency of Mg. Phos. in place of Super on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy after Paddy. (b) Paddy. (c) N.A. (ii) Medium deep black soil. (iii) 31.7.61 ; 19.7.62 27.7.63. (iv) (a) Ploughing and puddling for 61 and 62 and 2 ploughings and 1 levelling for 63(40). (b) Transplanting. (c) 49·4 kg/ha. (d) 20·3 cm.×20·3 cm. for 61 and 62 ; 23 cm.×23 cm. for 63. (e) 3. (v) 49·4 C.L./ha. of F.Y.M.+12350 kg/ha. of G.L. for 61(260) ; Nil ; 49·4 C.L./ha. of F.Y.M.+5604 kg/ha. sasbania (G.M,) for 63(40). (vi) G.E.B. 24. (vii) Irrigated. (viii) Weeding and interculturing. (ix) 41·8 cm. ; 46·8 cm. ; 44 cm. (x) 4.12.61 ; 29.11.62 ; 24.12.63.

2. TREATMENTS :

5 manurial treatments : $T_0$=Control, $T_1$=33·6 kg/ha. of $P_2O_5$ as Super, $T_2$=50·4 kg/ha. of $P_2O_5$ as Super, $T_3$=33·6 kg/ha. of Mg. Phos. and $T_4$=50·4 kg/ha- of Mg. Phos.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 15·1 m.×3·4 m. ; 1¼ cent ; 1/164·7 ha. (b) 11·1 m.× 2·7 m. ; 1 cent ; 1/247·1 ha. (v) and (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tiller counts and yield of grain. (iv) (a) 1961 to 1963. (b) No. (c) Nil. (v) and (vi) Nil. (vii) As the error variances are heterogeneous and Treatments×years interaction is absent. The results of the individual experiments are presented below.

5. RESULTS :

**61(260)**

(i) 4146 kg/ha. (ii) 294·9 kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. yield | 3750 | 4211 | 4352 | 4208 | 4211 |

C.D. =355·2 kg/ha.

**62(261)**

(i) 4321 kg/ha. (ii) 465·5 kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. yield | 4036 | 4555 | 4313 | 4302 | 4397 |

**63(40)**

(i) 3099 kg/ha. (ii) 278·1 kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. yieid | 2994 | 3054 | 3222 | 3124 | 3104 |

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**Crop :- Paddy.** **Ref :- Ms. 60(97), 61(72).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'M'.**

Object :—To find out the optium dose of N for Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 125·5 Q/na. of F.Y.M.+5604 Kg/ha. of G.L.+44·8 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$. (ii) Deep black soil. (iii) 3.2.60 ; 11.2.61/16.5.61. (iv) (a) 2 ploughings. (b) Transplanting. (c) N.A. (d) 23 cm.×23 cm. (e) 2. (v) 125·5 Q/ha. of F.Y.M.+5604 Kg/ha. of G.L.+44·8 Kg/ha. of $P_2O_5$ for 60(97) and 125·5 Q/ha. of F.Y.M.+44·8 Kg/ha. of $P_2O_5$ for 61(72). (vi) CO. 13 ; N.A. (vii) Irrigated. (viii) 1 weeding. (ix) 7 cm. ; 11 cm. (x) 9.5.60 ; N.A.

2. TREATMENTS :

4 levels of N : $T_0$=0, $T_1$=22·4, $T_2$=44·8 and $T_3$=67·2 Kg/ha.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 1/197·7 ha., 10·4 m.×7·9 m. (b) 1/329·4 ha. ; 1/247·0 ha. (v) 2 rows on either side. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iiii) Yield of grain. (iv) (a) 1958 to 1961. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Results of 58(61) and 59(65) are also taken into consideration. Error variances are homogeneous and Treatments×years interaction is present.

5. RESULTS :

(i) 2086 Kg/ha. (ii) 607·0 Kg/ha. (based on 9 d.f. made up of treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av. yield | 1947 | 2049 | 2192 | 2154 |

| Years | $T_0$ | $T_1$ | $T_2$ | $T_3$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|
| 1960 | 1797 | 1746 | 2348 | 2293 | * | 2046 | 343·5 |
| 1961 | 2364 | 2348 | 2004 | 1757 | N.S. | 2118 | 389·0 |
| Pooled | 2080 | 2047 | 2176 | 2025 | N.S. | 2082 | 607·3 |

**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 61(255), 62(256), 63(42), 64(34), 65(4).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'M'.**

Object :—To study the effect of F.Y.M. on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 12·4 Q/ha. of F.Y.M.+5600 Kg/ha. of G.L.+44·8 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$. (ii) Deep black soil. (iii) 18, 19.8.61 ; 16.7.62 ; 31.7.63 ; 21.7.64 ; 23.7.65. (iv) (a) 2 ploughings with victory plough. (b) Transplanting. (c) 49·4 Kg/ha. for 61, 62 and 65 and 18 to 22 Kg/ha. for 63 and 64. (d) 23 cm.×23 cm. (e) —. (v) Nil. (vi) G.E.B.—24 (late). (vii) Irrigated. (vii) Weeding and interculturing. (ix) 41·8 cm. ; 52·7 cm. ; 44 cm , 48 cm. ; 15·1 cm. (x) 22.12.61 ; 14.12.62 ; 16.12.63 ; 21.12.64 ; 30.12.65.

2. TREATMENTS:

6 manurial treatments : $T_0$=Control, $T_1$=24·7 C.L./ha. of F.Y.M, $T_2$=49·4 C.L./ha. of F.Y.M., $T_3$=22·4 Kg/ha. of N+$P_2O_5$ and $K_2O$ equal to 49·4 C.L./ha. of F.Y.M., $T_4$=22·4 Kg/ha. of N+$P_2O_5$ and $K_2O$ equal to 24·7 C.L./ha. of F.Y.M. and $T_5$=NPK equal to 2 4·7 C.L./ha. of F.Y.M.+24·7 C.L./ha. of F.Y.M.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 1/197·7 ha. (b) 1/247·1 ha. (v) 2 rows on either side. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield data. (iv) (a) 1961 to 1965. (b) Yes. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous and treatments× years interaction is present.

5. RESULTS :

(i) 1761 Kg/ha. (ii) 504·1 Kg/ha. (based on 20 d.f. made up of treatments×years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1535 | 1527 | 1701 | 1847 | 1670 | 2288 |

C.D.=271·5 Kg/ha.

| Years | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|
| 1961 | 1751 | 1598 | 1766 | 2055 | 2383 | 2419 | ** | 1995 | 339·4 |
| 1962 | 2051 | 2088 | 2268 | 2667 | 2109 | 3038 | ** | 2370 | 456·9 |
| 1963 | 1217 | 1196 | 1313 | 1432 | 1157 | 1816 | * | 1355 | 317·5 |
| 1964 | 1322 | 1372 | 1620 | 1688 | 1380 | 2562 | ** | 1657 | 548·9 |
| 1965 | 1334 | 1383 | 1538 | 1392 | 1319 | 1605 | N.S. | 1429 | 276·3 |
| Pooled | 1535 | 1527 | 1701 | 1847 | 1670 | 2288 | ** | 1761 | 504·1 |

**Crop :- Paddy** (*Kharif*). **Ref -: Ms. 60(98).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type -: 'M'.**

Object :—To find out the effect of different nitrogeneous fertilizers on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—G.M. (b) Paddy. (c) 125·5 Q/ha. of F.Y.M.+5604 Kg/ha. of G.L.+44·8 Kg/ha. of N+ 44·8 Kg/ha. of $P_2O_5$. (ii) Black clayey soil. (iii) 28.7.60. (iv) (a) N.A. (b) Japanees method of transplanting. (c) N.A. (d) 23 cm.×23 cm. (e) 21. (v) 125·5 Q/ha. of F.Y.M.+5604 Kg/ha. of G.L.+ 44·8 Kg/ha. of $P_2O_5$ as super. (vi) G.E.B. 24. (vii) Irrigated. (viii) 1 weeding with Japanese weeds. (ix) 49 cm. (x) 5 and 6.12.60.

2. TREATMENTS :

7 sources of N : $S_0=0$, $S_1$=A/S, $S_2$=Urea, $S_3$=A/C, $S_4$=A/S/N, $S_5$=C/A/N and $S_6$=C/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 1/164·7/ha. (b) 1/247·1/ha. (v) and (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—1960. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2828 Kg/ha. (ii) 318·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 2522 | 3054 | 2998 | 2662 | 3082 | 2914 | 2563 |

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**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 60 and 61(M.A.E.).**

**Site :- M.A.E. Centre, Mercara.** **Type :- 'M'.**

Object :—Type V : To study the effect of different times of application of N on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Heavy loam. (iii) N.A ; 3.6 61/15.7.61. (iv) (a) N.A. (b) Broadcasting. (c) 22 Kg/ha. (d) 25 cm.×25 cm. (e) 2. (v) Nil. (vi) BAM—3—P.S. (225 days). (vii) Unirrigated. (viii) 2 weedings and 1 intercultivation. (ix) N.A. (x) N A., 25.1.62.

2. TREATMENTS :

All combinations of (1) and (2)+a control
  (1) 2 sources of 44·8 Kg/ha. of N : $S_1$=A/S and $S_2$=Urea
  (2) 7 times of application of N : $T_1$=Full dose before planting, $T_2$=Full dose at planting, $T_3$=Full dose at tillering, $T_4=\frac{1}{2}$ before planting+$\frac{1}{2}$ at tillering, $T_5=\frac{1}{2}$ at planting+$\frac{1}{2}$ at tillering, $T_6=\frac{1}{3}$ before planting+$\frac{1}{3}$ at tillering+$\frac{1}{3}$ at flowering and $T_7=\frac{1}{3}$ at planting+$\frac{1}{3}$ at tillering+$\frac{1}{3}$ at flowering.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) and (b) N.A. (v) and (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1959—1961. (b) N.A. (c) Nil. (v) Shimoga. (vi) and (vii) Nil.

## 5. RESULTS:

**1960**

(i) 2447 Kg/ha. (ii) 155·2 Kg/ha. (iii) Main effect of T alone is significant. (iv) Av. yield of grain in Kg/ha.

Control=2370 Kg/ha.

| | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | Mean |
|---|---|---|---|---|---|---|---|---|
| $S_1$ | 2546 | 2177 | 2269 | 2582 | 2481 | 2490 | 2426 | 2424 |
| $S_2$ | 2426 | 2518 | 2250 | 2416 | 2453 | 2647 | 2665 | 2482 |
| Mean | 2486 | 2347 | 2259 | 2499 | 2467 | 2568 | 2546 | 2453 |

C.D. for T marginal means=183·6 Kg/ha.

**1961**

(i) 2954 Kg/ha. (ii) 337·3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=3099 Kg/ha.

| | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | Mean |
|---|---|---|---|---|---|---|---|---|
| $S_1$ | 3210 | 3154 | 2868 | 3090 | 2997 | 3016 | 2841 | 3025 |
| $S_2$ | 2933 | 3007 | 2278 | 3210 | 2739 | 2859 | 3007 | 2862 |
| | 3072 | 3080 | 2573 | 3150 | 2868 | 2938 | 2924 | 2944 |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 61, 62, 63(M.A.E.).**

**Site :- M.A.E. Centre, Shimoga.** **Type :- 'M'.**

Object :—Type (ix) : To study the effect of Nitrophosphate on Paddy.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (ii) Light red sandy loam. (iii) 24/25.9.61 ; 19/20.7.62 ; N.A. (iv)(a) Ploughing, puddling and levelling. (b) Transplanting. (c) 13·3 Kg/ha. ; 13·3 to 16·8 Kg/ha. ; N.A (d) 20·3 cm.×17·8 cm. ; 22·5 cm.×20·3 cm. ; N.A. (v) F.Y.M. at 5600 Kg/ha. ; 28·3 Kg/plot of Compost to all plots ; N.A. (v) S—701 (180 days). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 4, 8, 14, 15.1.1962 ; 28 and 29.11.62 ; N.A.

## 2. TREATMENTS :

All combinations of (1), (2) and (3)+4 extra treatments in each block.

(i) 3 types of phosphates : $P_1$=Super phosphate, $P_2$=ODDA-Nitro phosphate and $P_3$=PEC Nitro phosphate.

(ii) 3 leveles of $P_2O_5$ : $L_1$=11·7, $L_2$=23·4 and $L_3$=46·8 Kg/ha.

(iii) 3 methods of application :—$M_1$=Applied at puddling by broadcasting, $M_2$=applied at planting (6·4 cm. below seed) and $M_3$=immediately after planting (Band placement 6·35 cm. away from seed)

Extra treatment : $E_0$=0, $E_1$=13·4, $E_2$=26·8 and $E_3$=53·6 Kg/ha. of N.

3. DESIGN :

(i) $3^3$ confd. with 4 additional treatments. (ii) (a) 13. (b) N·A. (iii) 2. (iv) 4·9 m.×10.1 m. ; 5·0 m.× 10·3 m. ; N.A. (b) 4·5 m.×9·0 m. ; 4·5 m×9·0 m. ; N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Below normal. (ii) Heavy attack of stem borer and to some extent blast. Fytolan and folidol were sprayed for 61 ; N.A. for others. (iii) Grain and straw yield. (iv) (a) 1961 to 1963. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

**1961**

(i) 1150 Kg/ha. (ii) 310·0 Kg/ha. (iii) Main effect of L is highly significant. Main effects of M and N are significant. (iv) Av. yield of grain in Kg/ha.

$N_0$=756, $N_1$=1014, $N_2$=996, and $N_3$=1328 Kg/ha.

| | $P_1$ | $P_2$ | $P_3$ | $L_1$ | $L_2$ | $L_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $M_1$ | 1227 | 1153 | 1180 | 959 | 1190 | 1411 | 1187 |
| $M_2$ | 1033 | 1070 | 1051 | 913 | 1061 | 1180 | 1051 |
| $M_3$ | 1613 | 1355 | 1172 | 1152 | 1365 | 1624 | 1380 |
| Mean | 1291 | 1193 | 1134 | 1008 | 1205 | 1405 | 1206 |
| $L_1$ | 950 | 1023 | 1051 | | | | |
| $L_2$ | 1310 | 1227 | 1079 | | | | |
| $L_3$ | 1614 | 1328 | 1273 | | | | |

C.D. for L or M marginal means=208·9 Kg/ha.

C.D. for N marginal means=361·8 Kg/ha.

**1962**

(i) 2262 Kg/ha. (ii) 372·8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$N_0$=2393, $N_1$=2152, $N_2$=2297and $N_3$=2122 Kg/ha.

| | $P_1$ | $P_2$ | $P_3$ | $L_1$ | $L_2$ | $L_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $M_1$ | 2134 | 2063 | 2280 | 2174 | 2181 | 2123 | 2159 |
| $M_2$ | 2190 | 2029 | 2530 | 2224 | 2217 | 2309 | 2250 |
| $M_3$ | 2617 | 2294 | 2312 | 2290 | 2299 | 2634 | 2408 |
| Mean | 2314 | 2129 | 2374 | 2229 | 2232 | 2355 | 2272 |
| $L_1$ | 2337 | 2086 | 2265 | | | | |
| $L_2$ | 2325 | 1984 | 2388 | | | | |
| $L_3$ | 2279 | 2318 | 2468 | | | | |

**1963**

(i) 1445 Kg/ha. (ii) 200·5 Kg/ha. (iii) Interaction P×M alone is significant. (iv) Av. yield of grain in Kg/ha.

$N_0$=1520, $N_1$=1420, $N_2$=1387, and $N_3$=1560 Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $L_1$ | $L_2$ | $L_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $M_1$ | 1446 | 1286 | 1406 | 1383 | 1352 | 1401 | 1379 |
| $M_2$ | 1325 | 1320 | 1608 | 1464 | 1400 | 1389 | 1418 |
| $M_3$ | 1484 | 1608 | 1415 | 1458 | 1463 | 1586 | 1502 |
| Mean | 1418 | 1405 | 1476 | 1435 | 1405 | 1459 | 1433 |
| $L_1$ | 1415 | 1427 | 1463 | | | | |
| $L_2$ | 1377 | 1349 | 1490 | | | | |
| $L_3$ | 1462 | 1438 | 1476 | | | | |

C.D. for the body of P × M table=234·1 Kg/ha.

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**Crop :- Paddy (*Kharif*)** **Ref :- Ms. 62,63, 65(M.A.E.).**

**Site :- M.A.E. Centre, Shimoga.** **Type :- 'M'.**

Object :—Type V (a) : To study the effect of method of application of N on Paddy.

1· BASAL CONDITIONS :

(i) Nil. (b) Paddy. (c) 56 Q/ha. of compost+28Kg/ha. of N. (ii) Red soil. (iii) 25.7.62 ; 28.7.63 ; 13.8.65.(iv) (a) 3 ploughings and 2 puddlings. (b) Line planting. (c) 13 to 17 Kg/ha. (d) 20 cm. × 20 cm. (e) N.A. (v) Municipal compost at 5604 Kg/ha.+34 Kg/ha. of $P_2O_5$ as super ; Nil for 65. (vi) S. 701 (180 days). (vii) Irrigated. (viii) 2 hand weeding and passing rotary weeder. (ix) N.A. (x) 9/12.12.62 ; 13.12.63 ; 26.12 65.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(i) 3 levels of N : $N_1$=33·6, $N_2$=50·4 and $N_3$=67·2 Kg/ha.

(ii) 4 methods of application : $M_1$=Broadcast just before last puddling and in corporated in the soil (subsurface application). $M_2$=Broadcast at planting. $M_3$=Broadcast ½at planting+½ about one month after planting and $M_4$=Application in the form of pallets about 3 weeks after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) 10·1 m. × 5 0 m. (b) 9·1 m × 4.1 m. (v) 46 cm. × 46 cm. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A.(iii) Yield of grain. (iv) (a) 1962—1965 (N.A. for 64). (b) N.A.(c) Nil. (v) Virajpet. (vi) N.A. (vii) Nil.

5. RESULTS :

**1962.**

(i) 3502 Kg/ha. (ii) 404·9 Kg/ha. (iii) Main effect of N and control vs. others are highly significant. (iv) Av. yield of grain in Kg/ha.

Control=2230 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $N_1$ | 3536 | 3145 | 3635 | 2906 | 3306 |
| $N_2$ | 3575 | 3707 | 3737 | 3468 | 3622 |
| $N_3$ | 4001 | 4052 | 3871 | 3666 | 3897 |
| Mean | 3704 | 3635 | 3748 | 3347 | 3608 |

C.D for N marginal means=288·9 Kg/ha.
C.D for control vs. others=425·4 Kg/ha.

**1963.**

(i) 3244 Kg/ha. (ii) 360·6 Kg/ha. (iii) Main effect of N and control vs. others are highly significant. (iv) Av. yield of grain in Kg/ha.

Control=2302 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $N_1$ | 3128 | 3130 | 3227 | 2924 | 3102 |
| $N_2$ | 3388 | 3359 | 3229 | 3423 | 3337 |
| $N_3$ | 3443 | 3513 | 3588 | 3563 | 3527 |
| Mean | 3303 | 3334 | 3348 | 3303 | 3322 |

C.D for N marginal means=257·5 Kg/ha.
C.D for control vs. others=378·9 Kg/ha.

**1965.**

(i) 3080 Kg/ha. (ii) and (iii) N.A. (iv) Av. yield of grain in Kg/ha.

Control=2215 Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $N_1$ | $N_2$ | $N_3$ |
|---|---|---|---|---|---|---|---|
| Mean yield | 3073 | 2703 | 3272 | 3562 | 2978 | 3157 | 3322 |

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**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 60, 61, 62, 63(M.A.E.).**
**Site :- M.A.E. Centre, Shimoga.** **Type :- 'M'.**

Object :—Type II : To study the effect of different levels of N, P, K and F.Y.M. on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Red sandy loam. (iii) 14/15.7.1960 ; 5/6.8.1961. ; 18.7.1962; 18.7.1963. (iv) (a) 2 puddlings with plough and levelling. (b) Line planting. (c) 20 Kg/ha. (d) 20 cm.×15 cm. (e) N.A. (v) N.A. (vi) S—701 (180 days duration). (vii) Irrigated. (viii) 2 weedings for 60 ; N.A. for others. (ix) N.A. (x) 21.11.60 and 1.12.60 ; 8/9.12.1961 ; 10 to 12.12.1962 ; 8 12.1963.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)
(1) 3 levels of N as A/S : $N_0=0$, $N_1=33{\cdot}6$ and $N_2=67{\cdot}2$ Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_0=0$, $P_1=33{\cdot}6$ and $P_2=67{\cdot}2$ Kg/ha.
(3) 3 levels of $K_2O$ as Mur. Pot. : $K_0=0$, $K_1=33{\cdot}6$ and $K_2=67{\cdot}2$ Kg/ha.
(4) 2 levels of F.Y.M. : $F_0=0$ and $F_1=5604$ Kg/ha.

A/S broadcast at planting, Super at final puddling and Mur. Pot. broadcast at planting.

3. DESIGN :

(i) $3^3 \times 2$ Confd. (ii) (a) 9 plots/block ; 6 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 10·1 m.×5·5 m for 60 ; 10·1 m.×4·9 m. for 61 ; 10·0 m.×5·1 m. for 62; N.A. for 63. (b) 9·1 m.×4·5 m. for 60, 61; 9·1 m.×4·2 m. for 62 ; N.A. for 63. (v) 48 cm.×51 cm. for 60 ; 48 cm.×20 cm. for 61 ; 46 cm.×39 cm. for 62 ; N.A. for 63. (vi) Yes.

4. GENERAL :
(i) Normal. (ii) Stem borer attack in all plots and folidol sprayed for 60 ; N.A. for others. (ii) Yield of grain and straw. (iv) (a) 1959 contd. (b) N.A. (c) Nil. (v) N.A. (vi) Heavy rains at the end of October was harmful for fertilization and seed setting for 60 ; N.A. for others. (vii) Nil.

5. RESULTS :

**1960**

(i) 2788 Kg/ha. (ii) 398·4 Kg/ha. (iii) Main effects of N, P and F are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 2038 | 2555 | 2647 | 1798 | 2675 | 2766 | 2536 | 2490 | 2213 | 2413 |
| $F_1$ | 2896 | 3283 | 3311 | 2914 | 3329 | 3246 | 3062 | 3163 | 3264 | 3163 |
| Mean | 2467 | 2919 | 2979 | 2356 | 3002 | 3006 | 2799 | 2826 | 2738 | 2788 |
| $K_0$ | 2546 | 2961 | 2890 | 2398 | 2878 | 3121 | | | | |
| $K_1$ | 2416 | 2887 | 3175 | 2453 | 3108 | 2917 | | | | |
| $K_2$ | 2439 | 2908 | 2871 | 2216 | 3019 | 2980 | | | | |
| $P_0$ | 2177 | 2490 | 2402 | | | | | | | |
| $P_1$ | 2536 | 3154 | 3316 | | | | | | | |
| $P_2$ | 2688 | 3113 | 3218 | | | | | | | |

C.D. for N or P marginal means=274·1 Kg/ha.
C.D. for F marginal means =223·7 Kg/ha.

**1961**

(i) 2171 Kg/ha. (ii) 292·5 Kg/ha. (iii) Main effects of N and K and interaction F×K are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 1817 | 2084 | 2462 | 2278 | 1937 | 2148 | 2444 | 1771 | 2148 | 2121 |
| $F_1$ | 1865 | 2268 | 2530 | 2186 | 2225 | 2253 | 2216 | 2231 | 2216 | 2221 |
| Mean | 1841 | 2176 | 2496 | 2232 | 2081 | 2201 | 2330 | 2001 | 2182 | 2171 |
| $K_0$ | 1900 | 2315 | 2776 | 2527 | 2103 | 2361 | | | | |
| $K_1$ | 1697 | 2038 | 2269 | 1964 | 1965 | 2075 | | | | |
| $K_2$ | 1927 | 2176 | 2443 | 2205 | 2175 | 2167 | | | | |
| $P_0$ | 1918 | 2177 | 2601 | | | | | | | |
| $P_1$ | 1697 | 2167 | 2379 | | | | | | | |
| $P_2$ | 1909 | 2185 | 2509 | | | | | | | |

C.D. for N or K marginal means=201·2 Kg/ha.
C.D. for body of F×K table =348·4 Kg/ha.

**1962**

(i) 3438 Kg/ha. (ii) 296·2 Kg/ha. (iii) Main effects of N and P are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 2874 | 3405 | 3649 | 3189 | 3229 | 3510 | 3424 | 3122 | 3381 | 3309 |
| $F_1$ | 3139 | 3690 | 3870 | 3204 | 3722 | 3773 | 3472 | 3657 | 3570 | 3566 |
| Mean | 3006 | 3547 | 3760 | 3197 | 3475 | 3642 | 3449 | 3390 | 3476 | 3438 |
| $K_0$ | 3029 | 3557 | 3760 | 3404 | 3425 | 3516 | | | | |
| $K_1$ | 2914 | 3432 | 3823 | 3076 | 3406 | 3686 | | | | |
| $K_2$ | 3077 | 3654 | 3696 | 3109 | 3595 | 3722 | | | | |
| $P_0$ | 2841 | 3188 | 3561 | | | | | | | |
| $P_1$ | 2990 | 3587 | 3848 | | | | | | | |
| $P_2$ | 3188 | 3867 | 3870 | | | | | | | |

C.D. for N or P marginal means=203·7 Kg/ha.

**1963**

(i) 2636 Kg/ha. (ii) 257·8 Kg/ha. (iii) Main effects of N and P are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 2046 | 2718 | 3124 | 2533 | 2531 | 2824 | 2649 | 2570 | 2669 | 2629 |
| $F_1$ | 2078 | 2692 | 3156 | 2318 | 2709 | 2899 | 2538 | 2750 | 2638 | 2642 |
| Mean | 2062 | 2705 | 3140 | 2426 | 2620 | 2861 | 2593 | 2660 | 2654 | 2636 |
| $K_0$ | 2002 | 2690 | 3088 | 2389 | 2540 | 2851 | | | | |
| $K_1$ | 2102 | 2678 | 3199 | 2493 | 2625 | 2861 | | | | |
| $K_2$ | 2082 | 2746 | 3133 | 2396 | 2694 | 2871 | | | | |
| $P_0$ | 2011 | 2445 | 2821 | | | | | | | |
| $P_1$ | 2050 | 2662 | 3147 | | | | | | | |
| $P_2$ | 2124 | 3007 | 3453 | | | | | | | |

C.D. for N or P marginal means=177·3 Kg/ha.

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 62, 63, 64(M.A.E.).**

**Site :- M.A.E. Centre, Virajpet.** **Type :- 'M'.**

Object :—Type II : To study the effect of different levels of N, P, K and F.Y.M. on the yield of Paddy.

## 1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) Light loam. (iii) 21.6.62/4 to 6.8.1962 ; 5.8.1963 ; 6.8.1964. (iv) (a) to (e) N.A. (v) N.A. (vi) PS—1 (180 days). (vii) Unirrigated. (viii) and (ix) N.A. (x) 5.1.1963 ; 19,1.1964 ; 6.1.1965.

## 2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=33{\cdot}6$ and $N_2=67{\cdot}2$ Kg/ha.

(2) 3 levels of $P_2O_5$ as Super : $P_0=0$, $P_1=33{\cdot}6$ and $P_2=67{\cdot}2$ Kg/ha.

(3) 3 levels of $K_2O$ as Mur. Pot. : $K_0=0$, $K_1=33{\cdot}6$ and $K_2=67{\cdot}2$ Kg/ha.

(4) 2 levels of F.Y.M. : $F_0=0$ and $F_1=56{\cdot}4$ Kg/ha.

## 3. DESIGN :

(i) $3^3\times 2$ Confd. (ii) (a) 9 plots/block ; 6 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 10·1 m.×5·1 m. for 62 ; N.A. for others. (b) 6·4 m.×4·1 m. for 62 ; N.A. for others. (v) 35 cm.×51 cm. for 62 ; N.A. for others. (vi) Yes.

## 4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1962—contd. (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS:

### 1962

(i) 2396 Kg/ha. (ii) 196·4 Kg/ha. (iii) Main effects of N, P, K are highly significant. Interaction N×P and F×K are significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 2085 | 2302 | 2518 | 2071 | 2427 | 2406 | 2078 | 2371 | 2455 | 2301 |
| $F_1$ | 2276 | 2608 | 2595 | 2357 | 2528 | 2584 | 2462 | 2511 | 2497 | 2490 |
| Mean | 2176 | 2455 | 2556 | 2214 | 2478 | 2495 | 2270 | 2441 | 2476 | 2396 |
| $K_0$ | 2082 | 2380 | 2349 | 2019 | 2370 | 2422 | | | | |
| $K_1$ | 2186 | 2401 | 2736 | 2364 | 2490 | 2469 | | | | |
| $K_2$ | 2260 | 2584 | 2584 | 2260 | 2574 | 2594 | | | | |
| $P_0$ | 2139 | 2275 | 2228 | | | | | | | |
| $P_1$ | 2270 | 2532 | 2631 | | | | | | | |
| $P_2$ | 2118 | 2558 | 2809 | | | | | | | |

C.D. for N, P or K marginal means=135·2 Kg/ha.

C.D. for body of N×P table =234·0 Kg/ha.

C.D. for body of F×K table =191·1 Kg/ha.

### 1963

(i) 2573 Kg/ha. (ii) 260·6 Kg/ha. (iii) Main effects of F, N, P are highly significant and that of K is significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 2037 | 2552 | 2614 | 2129 | 2598 | 2475 | 2245 | 2475 | 2483 | 2401 |
| $F_1$ | 2560 | 2875 | 2798 | 2545 | 2813 | 2875 | 2606 | 2898 | 2729 | 2744 |
| Mean | 2298 | 2714 | 2706 | 2337 | 2706 | 2675 | 2425 | 2687 | 2606 | 2573 |
| $K_0$ | 2260 | 2583 | 2433 | 2133 | 2594 | 2548 | | | | |
| $K_1$ | 2410 | 2791 | 2860 | 2491 | 2848 | 2721 | | | | |
| $K_2$ | 2225 | 2767 | 2825 | 2387 | 2675 | 2756 | | | | |
| $P_0$ | 2168 | 2398 | 2445 | | | | | | | |
| $P_1$ | 2479 | 2791 | 2848 | | | | | | | |
| $P_2$ | 2248 | 2952 | 2825 | | | | | | | |

C.D. for N, P or K marginal means = 179·4 Kg/ha.
C.D. for F marginal means = 146·3 Kg/ha.

**1964**

(i) 2972 Kg/ha. (ii) 198·1 Kg/ha. (iii) Main effects of N and P are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 2545 | 2806 | 2914 | 2445 | 2906 | 2914 | 2683 | 2768 | 2814 | 2755 |
| $F_1$ | 3014 | 3245 | 3306 | 3014 | 3237 | 3314 | 3252 | 3175 | 3137 | 3188 |
| Mean | 2779 | 3026 | 3110 | 2729 | 3072 | 3114 | 2968 | 2972 | 2976 | 2972 |
| $K_0$ | 2860 | 2941 | 3102 | 2687 | 3114 | 3102 | | | | |
| $K_1$ | 2768 | 2964 | 3183 | 2825 | 3068 | 3022 | | | | |
| $K_2$ | 2710 | 3172 | 3045 | 2676 | 3033 | 3218 | | | | |
| $P_0$ | 2549 | 2814 | 2825 | | | | | | | |
| $P_1$ | 2940 | 3068 | 3206 | | | | | | | |
| $P_2$ | 2849 | 3195 | 3298 | | | | | | | |

C.D. for N or P marginal means = 135·2 Kg/ha.

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 62 to 65 (M.A.E.).**
**Site :- M.A.E. Centre, Virajpet.** **Type :- 'M'.**

Object :—Type V (a) : To study the effect of method of application of N on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Red soil. (ii) 6.7.62/13 to 17.8.62 ; 7.7.63/10.8.63 to 17.8.63 ; 25.8.64 ; 9.7.65/17.8.65. (iv) (a) 5 ploughings. (b) Broadcast. (c) 28 Kg/ha. (d) 25 cm. × 25 cm, (e) 3 to 4. (v) 34 Kg/ha of $P_2O_5$ as Super. (vi) Mambiliya; Ambla ; Mb-319 ; N.A. (vii) Unirrigated. (viii) 1 to 5 weedings. (ix) N.A. (x) 27, 28.12.62; 21, 22.12.63; 10.1.65; 17, 18.1.66.

2. TREATMENTS :

All combinations of (1) and (2) +a control.

(1) 3 levels of N : $N_1=33{\cdot}6$, $N_2=50{\cdot}4$ and $N_3=67{\cdot}2$ Kg/ha.

(2) 4 methods of application : $M_1$= Broadcast just before last puddling and in corporated in the soil (Sub surface application) $M_2$=Broadcast at planting, $M_3$=Broadcast $\frac{1}{2}$ at planting $+\frac{1}{2}$ about one month after planting and $M_4$=Application the form of pellets about 3 weeks after planting.

3: DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) 10·2 m. × 5·1 m. (b) 8·9 m. × 4·1 m. (v) 64 cm. × 51 cm. (vi) Yes.

4. GENERAL :

(i) and) (ii) N.A. (iii) Yield of grain. (iv) (a) 1962—1966. (b) N.A. (c) Nil. (v) Shimoga. (vi) N.A. (vii) Nil.

5. RESULTS :

**1962**

(i) 2506 Kg/ha. (ii) 276·5 Kg/ha. (iii) control vs. others alone is highly significant (iv) Av. yield of grain in Kg/ha.

Control=2040 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $N_1$ | 2205 | 2464 | 2480 | 2691 | 2460 |
| $N_2$ | 2542 | 2629 | 2409 | 2534 | 2528 |
| $N_3$ | 2425 | 2629 | 2754 | 2778 | 2646 |
| Mean | 2391 | 2574 | 2548 | 2668 | 2545 |

C.D. for Control vs. others=290.5 Kg/ha.

**1963**

(i) 1966 Kg/ha. (ii) 222.2 Kg/ha. (iii) None of the effects is significant (iv) Av. yield of grain in Kg/ha.

Control=1781 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $N_1$ | 1937 | 1954 | 1989 | 2248 | 2032 |
| $N_2$ | 1972 | 1816 | 2058 | 1885 | 1933 |
| $N_3$ | 1989 | 1885 | 2058 | 1989 | 1980 |
| Mean | 1966 | 1885 | 2035 | 2041 | 1982 |

**1964**

(i) 2887 Kg/ha. (ii) 261·0 Kg/ha. (iii) "Control vs. others" is highly significant. Main effect of M is significant. (iv) Av. yield of grain in Kg/ha.

Control=2479 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $N_1$ | 2693 | 2765 | 2889 | 2996 | 2836 |
| $N_2$ | 2765 | 2800 | 3228 | 2872 | 2916 |
| $N_3$ | 2872 | 2979 | 2979 | 3210 | 3010 |
| Mean | 2777 | 2848 | 3032 | 3026 | 2921 |

C. D. for M marginal means=215·1 Kg/ha.

C. D. for Control vs. others =274·2 Kg/ha.

**1965**

(i) 2421 Kg/ha. (ii) and (iii) N.A. (iv) Av. yield of grain in Kg/ha.

Control=2356 Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $N_1$ | $N_2$ | $N_3$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 2535 | 2287 | 2459 | 2425 | 2299 | 2451 | 2529 |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 63 and 65(M.A.E.).**

**Site :- M.A.E. Centre, Virajpet.** **Type :- 'M'.**

Object :—Type XI : To study the effect of method of application of micronutrients on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) G. L. at 33.6 Q/ha. (ii) Light loam. (iii) 29.8 1963 ; 9.7,65/24.8.65. (iv) (a) 4 ploughings ; 6 ploughings. (b) Broadcast. (c) 28 Kg/ha. (d) 25 cm.× 25 cm. (e) 3 to 4. (v) N.A (vi) Mambiliya. (vii) Unirrigated. (viii) 2 weedings ; 5 weedings. (ix) N.A. (x) 12,1.1964 ; 22.1.66.

2, TREATMENTS

All combinations of (1) and (2) +3 extra treatments.

(1) 6 sources of micronutrients : $S_1$=Mn. Sul. ; $S_2$=Zn. Sul. ; $S_3$=Cu. Sul. ; $S_4$=Borax ; $S_5$=Soduim Molybdate and $S_6=S_1+S_2+S_3+S_4+S_5$.

(2) 2 Methods of application : $M_1$=Soil application and $M_2$=Foliar spray.

Extra treatments : To=Control, $T_1$=35 Kg/ha. each of N, $P_2O_5$ and $K_2O$ and $T_2$= Spartin at 395 Kg/ha.

$T_1$ is also applied to 12 plots receiving micronutrients and to $T_2$ plot optimum dose of each micronutrients for the two methods has been tried. $T_1$ and $T_2$ applied to soil

3. DESIGN :

(i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1963—1966. (b) N.A. (c) Nil. (v) Nil. (vi) N.A.

5. RESULTS :

**1963**

(i) 1955 Kg/ha. (ii) N.A. (iii) 'Control vs. others' and '$T_0$ vs. $T_1$' are highly significant. (iv) Av. yield of grain in Kg/ha.

$T_0$=1499 Kg/ha., $T_1$=1987 Kg/ha. and $T_2$=1935 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | Mean |
|---|---|---|---|---|---|---|---|
| $M_1$ | 1917 | 1900 | 1952 | 2006 | 1987 | 2092 | 1976 |
| $M_2$ | 1813 | 2162 | 2144 | 2074 | 1865 | 1988 | 2008 |
| Mean | 1865 | 2031 | 2048 | 2040 | 1926 | 2040 | 1992 |

65(MAE)

(i) 2120 Kg/ha. (ii) N.A. (iii) Main effect of S is significant. (iv) Av. yield of grain in Kg/ha.

To=1462 Kg/ha. $T_1$=2134 Kg/ha. and $T_2$=2099 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | Mean |
|---|---|---|---|---|---|---|---|
| $M_1$ | 2168 | 2323 | 2254 | 2151 | 1980 | 2100 | 2163 |
| $M_2$ | 2048 | 2409 | 2374 | 2117 | 2031 | 2151 | 2188 |
| Mean | 2108 | 2366 | 2314 | 2134 | 2006 | 2126 | 2176 |

C.D. for S marginal means=224 Kg/ha.

C.D. for M marginal means=212 Kg/ha.

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**Crop :- Paddy (*Rabi*).** **Ref :- Ms. 62 (SFT) for Mysore ; 62, 63 (SFT) for N. Kanara and 63, 64 (SFT) for S. Kanara.**

**Site :- (District) : Mysore, N. Kanara and S. Kanara.** **Type : 'M'.**

Object :—Type $A_1$ —To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite for S. Kanara and N. Kanara and Red sandy for Mysore. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments

O =Control (no manure)
$N_1$ =35 Kg/ha. of N
$N_2$ =70 Kg/ha. of N
$P_1$ =35 Kg/ha. of $P_2O_5$
$N_1P_1$ =35 Kg/ha. of N+35 Kg/ha. of $P_2O_5$
$N_2P_1$ =70 Kg/ha. of N+35 Kg/ha. of $P_2O_5$
$N_2P_2$ =70 Kg/ha. of N+70 Kg/ha. of $P_2O_5$
$N_2P_2K_1$ =70 Kg/ha. of N+70 Kg/ha. of $P_2O_5$+35 Kg/ha of $K_2O$

N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

A selected district is divided into four agriculturally homogeneous zones based on climate, soil, cropping pattern etc. In each zone one block is selected at random. A block normally consists of a group of 50-100 villages. In each block 36 experiments are conducted in a year of which 11 are of type $A_1$, 11 of type $A_2$, 11 of type $A_3$ and 3 are of type—C. The eleven experiments under type $A_1$, $A_2$ and $A_3$ are distributed as 3 on a *Kharif* cereal, 3 on a *rabi* cereal, 3 on a cash crop and 2 on oilseed. All the three type—C experiments are conducted on a legume crop. For the purpose of conducting the $A_1$, $A_2$ and $A_3$ experiments 11 villages are randomly selected in each block and in each village 3 experiments one each of type $A_1$, $A_2$ and $A_3$ are laid out. For conducting the three type—C trials three villages are randomly selected in each block.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962—only for Mysore ; 1962 to 1963 for N. Kanara and 1963 to 1964 for S. Kanara. (b) N.A. (c) Nil. (v) to (vii) N.A.

## 5. RESULTS :

**Mysore**
62(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 1192 | 941 | 483 | 803 | 985 | 796 | 1193 | 164·5 |

Control yield=2423 Kg/ha. ; No. of trials=4.

**N. Kanara**
62(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 441 | 603 | 293 | 567 | 692 | 681 | 862 | 56·5 |

Control yield=2006 Kg/ha. ; No. of trials=8.

63(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 384 | 660 | 196 | 694 | 864 | 988 | 1087 | 66·7 |

Control yield=2001 Kg/ha. ; No. of trials=9.

**S. Kanara**
63(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 257 | 415 | 341 | 515 | 763 | 865 | 1084 | 91·8 |

Control yield=1272 Kg/ha. ; No. of trials=8.

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 293 | 666 | 272 | 454 | 585 | 1086 | 1346 | 181·3 |

Control yield=1334 Kg/ha. ; No. of trials=3.

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**Crop :- Paddy** (*Kharif*).

**Ref :- Ms. 63(SFT) for N. Kanara, and Hassan ; 62(SFT) for Banglore ; 65 (SFT) for Bellary ; 63, 64 (SFT) for Chikmagalur and Mysore ; 64, 65(SFT) for Mandya.**

**Site :- (District) : Banglore. Bellary Chikmagalur, Hassan, Mandya, Mysore, and N. Kanara.**

**Type :- 'M'.**

Object :—Type $A_1$ : To study the response curves of important cereal: cash and oilseed crops to nitrogen applied singly and in combination with other nutrients.

1- BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite for N. Kanara ; loamy for Chikmagalur ; red loamy for Banglore and red sandy for others. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in type $A_1$ (Rabi) on page 65.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962 to 1966 [1963 to 1965 N.A.] for Banglore ; 1965—only for Bellary ; 1963 to 1964 for Chikmagalur ; 1964 to 1966 for Mandya ; 1963 to 1966 [1965 N.A. for Mysore and 1964 and 1965 N.A. for Hassan and N. Kanara] for others. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

**N. Kanara**

**63(S.F.T.)**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 327 | 416 | 223 | 514 | 652 | 813 | 850 | 77·7 |

Control yield=3124 Kg/ha. ; No. of trials=3.

**Banglore**

**62(S.F.T.)**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 716 | 1199 | 92 | 530 | 1315 | 1315 | 1500 | 179·6 |

Control yield=1590 Kg/ha. ; No. of trials=2.

**Bellary**

**65(S.F.T.)**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 590 | 803 | 468 | 863 | 1082 | 1226 | 1237 | 86.3 |

Control yield=2746 Kg/ha. ; No. of trials=8.

**Chikmagalur**

**63(S.F.T.)**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 425 | 1156 | 98 | 938 | 1354 | 2233 | 2757 | 155·9 |

Control yield=1532 Kg/ha. ; No. of trials=5.

**64(S.F.T.)**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 500 | 819 | 585 | 1216 | 1518 | 1994 | 2390 | 124·9 |

Control yield=2059 Kg/ha. ; No. of trials=33.

**Mysore**

**63(S.F.T.)**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 352 | 494 | 236 | 494 | 454 | 704 | 1047 | 112·0 |

Control yield=2183 Kg/ha. ; No. of trials=10.

**64(S.F.T.)**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 494 | 1660 | 1300 | 786 | 1032 | 1254 | 1515 | 174·6 |

Control yield=3772 Kg/ha. ; No. of trials=13.

**Hassan**
63(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 463 | 644 | 437 | 223 | 915 | 994 | 1155 | 237·6 |

Control yield=2392 Kg/ha. ; No. of trials=4.

**Mandya**
64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 345 | 617 | 345 | 49 | 74 | 642 | 988 | 275·9 |

Control yield=5436 Kg/ha. ; No. of trials=3.

65(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 283 | 500 | 300 | 766 | 833 | 1166 | 1433 | 78·1 |

Control yield=3899 Kg/ha. ; No. of trials=6.

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**Crop :- Paddy (*Kharif*).**

**Ref :- Ms. 63, 64 (SFT) for Belgaum and Shimoga; 63(SFT) for Chikmagalur and Hassan ; 63. 64, 65 (SFT) for N. Kanara and 64 (SFT) for S. Kanara.**

**Site :- (District) . Belgaum, Chikmagalur, Hassan, N. Kanara, Shimoga and S. Kanara.**

**Type :- 'M'.**

Object :—Type $A_1$—To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with other nutrients.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) Deep black for Belgaum ; Red loamy for Chikmagalur ; Laterite for N. Kanara and S. Kanara and Red sandy for others. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS : and 3. DESIGN :

Same as in Type $A_1$ (Rabi) on page 65.

4. GENERAL:

(i) to (iii) N.A. (iv) (a) 1963 to 1964 for Balgaum and Shimoga ; 1963— only for Chikmagalur and Hassan ; 1963 to 1966 for N. Kanara ; 1964—only for S. Kanara. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**Belgaum**
63(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 326 | 471 | 224 | 364 | 487 | 557 | 595 | 44·4 |

Control yield=2081 Kg/ha. ; No. of trials=7.

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 324 | 668 | 94 | 384 | 757 | 791 | 892 | 93·1 |

Control yield=2121 Kg/ha. ; No. of trials=5.

**Chikmagalur**

63(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 434 | 747 | 284 | 816 | 1159 | 1920 | 2676 | 97·1 |

Control yield=2022 Kg/ha. ; No. of trials=18.

**Hassan**

63(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 236 | 285 | 329 | 442 | 434 | 653 | 792 | 109·5 |

Control yield=1600 Kg/ha. ; No. of trials=8.

**N. Kanara**

63(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 290 | 759 | 330 | 677 | 774 | 1182 | 1315 | 97·8 |

Control yield=3270 Kg/ha. ; No. of trials=13.

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 370 | 640 | 330 | 730 | 970 | 1270 | 1500 | 49·0 |

Control yield=3260 Kg/ha. ; No. of trials=30.

65(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 299 | 506 | 231 | 600 | 891 | 1162 | 1372 | 43·9 |

Control yield=2840 Kg/ha. ; No. of trials=25.

**Shimoga**

63(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av response of grain in Kg/ha. | 121 | 233 | 126 | 381 | 318 | 468 | 575 | 28·7 |

Control yield=2727 Kg/ha. ; No. of trials=14.

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 843 | 856 | 762 | 1730 | 2141 | 2271 | 3543 | 559·8 |

Control yield=3123 Kg/ha. ; No. of trials=2.

**S. Kanara**
64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 575 | 875 | 395 | 810 | 833 | 996 | 1218 | 297·7 |

Control yield=1251 Kg/ha. ; No. of trials=2.

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**Crop :- Paddy** (*Rabi*).

**Ref :-** Ms. **62 (SFT) for Mysore ; 62, 63 (SFT) for N. Kanara and 63, 64 (SFT) for S. Kanara.**

**Site :- (District)** : Mysore, **N. Kanara and S. Kanara.**

**Type :- 'M':**

Object :—Type $A_2$—To study response curves of important cereal, cash and oilseed crops to Phosphorus applied singly in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite for N. Kanara and S. Kanara ; Red sandy for others. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :

O=Control (no manure)
$N_1$=35 Kg/ha. of N
$P_1$=35 Kg/ha. of $P_2O_5$
$P_2$=70 Kg/ha. of $P_2O_5$
$N_1P_1$=35 Kg/ha. of N+35 Kg/ha. of $P_2O_5$
$N_1P_2$=35 Kg/ha. of N+70 Kg/ha. of $P_2O_5$
$N_2P_2$=70 Kg/ha. of N+70 Kg/ha. of $P_2O_5$
$N_2P_2K_2$=70 Kg/ha. of N+70 Kg/ha. of $P_2O_5$+70 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in type $A_1$ (*rabi*) on page 65.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962 to 1964 [1963, 1964 N.A. for Mysore, 1964 N.A. for N. Kanara] for Mysore and N. Kanara ; 1963 to 1964 for S. Kanara. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**Mysore**
62(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 1473 | 837 | 1168 | 1428 | 1460 | 1116 | 968 | 67·8 |

Control yield=2464 Kg/ha ; No. of trials=3.

**N. Kanara**
62(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 405 | 260 | 312 | 492 | 562 | 663 | 797 | 59·0 |

Control yield=1956 Kg/ha. ; No, of trials=8.

63(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 309 | 164 | 240 | 442 | 523 | 852 | 939 | 69·6 |

Control yield=1923 Kg/ha. ; No. of trials=9.

S. Kanara

63(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 186 | 190 | 374 | 433 | 489 | 841 | 1038 | 78·5 |

Control yield=1373 Kg/ha. ; No. of trials=10.

64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 493 | 349 | 546 | 475 | 808 | 1143 | 1400 | 107·3 |

Control yield=1464 Kg/ha ; No. of trials=6.

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**Crop :- Paddy (*Kharif*).**

**Ref :-** **Ms. 62(SFT) for Banglore ; 65 (SFT) for Bellary and Mandya ; 63, 64 (SFT) for Chikmagalur & Mysore ; 63 (SFT) for Hassan and N. Kanara and 64 (SFT) for Shimoga and S. Kanara.**

**Site :- (District) : Banglore, Bellary, Chikmagalur, Hassan, Mandya, Mysore, N. Kanara, Shimoga and S. Kanara.**

**Type :- 'M'.**

Object :—Type $A_2$—To study the response curves of important cereal, cash and oilseed crops to Phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red loamy for Banglore ; loamy for Chikmagalur ; laterite for N. Kanara and S. Kanara and red sandy for others. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in type $A_1$ (Rabi) on page 70.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962 to 1966 [1963 to 1965 N.A. for Banglore 1962, 1965 N.A. for Mysore] for Banglore and Mysore ; 1965—only for Bellary ; 1963 to 1964 for Chikmagalur ; 1963—only for Hassan and N. Kanara ; 1965 to 1966 for Mandya ; 1964—only for others. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

N Kanara

Bellary

65(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 698 | 575 | 636 | 1030 | 1071 | 1389 | 1424 | 69·8 |

Control yield=2604 Kg/ha.; No. of trials=3.

**Banglore**

62(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 399 | 322 | 738 | 576 | 983 | 738 | 1368 | 159·6 |

Control yield= 2290 Kg/ha. ; No. of trials=3.

**Chikmagalur**

63(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 807 | 378 | 1367 | 1251 | 1845 | 2421 | 3475 | 353·4 |

Control yield=1416 Kg/ha. ; No. of trials=3.

64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 641 | 572 | 819 | 841 | 1021 | 1620 | 1869 | 88·1 |

Control yield=1354 Kg/ha. ; No. of trials=11.

**Hassan**

63(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 389 | 371 | 492 | 481 | 723 | 855 | 1104 | 142·7 |

Control yield=1971 Kg/ha. ; No. of trials=5.

**Mandya**

65(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 483 | 425 | 608 | 849 | 1016 | 1262 | 1708 | 70·4 |

Control yield=3899 Kg/ha ; No. of trials=9.

**Mysore**

63(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 261 | 248 | 309 | 363 | 349 | 544 | 914 | 115·3 |

Control yield=2250 Kg/ha ; No. of trials=10.

64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 646 | 471 | 722 | 910 | 999 | 1196 | 1852 | 196·6 |

Control yield=3753 Kg/ha ; No. of trials=13.

**N. Kanara**

63(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 191 | 118 | 263 | 223 | 442 | 600 | 706 | 50·5 |

Control yield=2857 Kg/ha. ; No. of trials=4.

**Shimoga**

64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 1491 | 1685 | 1563 | 2149 | 2445 | 2682 | 3860 | 529·1 |

Control yield=2600 Kg/ha. ; No. of triais=3.

**S. Kanara**

64 (S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 299 | 144 | 44 | 341 | 301 | 494 | 838 | 197·4 |

Control yield=1387 Kg/ha. ; No. of trials=3.

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**Crop :. Paddy** (*Kharif*).

**Ref :- Ms. 63, 64 (SFT) for Belgaum ; 63 (SFT) for Chikmagalur & Shimoga and Hassan and 63, 64, 65(SFT) for N. Kanara.**

**Site :- (District) : Belgaum, Chikmagalur, Hassan, N. Kanara and Shimoga.**

**Type :- 'M'.**

Object :—Type $A_2$—To study the response curves of important cereal, cash and oilseed crops to Phosphorus applied singly and in cambination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Deep black foı Belgaum ; Red loamy for Chikmagalur ; Laterite for N. Kanara and Red sandy for others. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS : and 3. DESIGN :

Same as in type $A_2$ (Rabi) on page 70.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1963 to 1964 for Belgaum and Hassan [1964 for Hassan N.A] ; 1963—only for Chikmagalur and Shimoga and 1963 to 1966 for N. Kanara. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

**Belgaum**

63(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 343 | 147 | 173 | 318 | 369 | 608 | 761 | 71·6 |

Control yield=299 Kg/ha. ; No. of trials=7.

**64(S.F.T.)**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 325 | 128 | 144 | 359 | 359 | 699 | 717 | 90·3 |

Control yield=1942 Kg/ha ; No. of trials=5.

**Chikmagalur**

**63(S.F.T.)**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 516 | 346 | 650 | 845 | 1193 | 1935 | 2698 | 113·5 |

Control yield=2283 Kg/ha ; No. of trials=16.

**Hassan**

**63(S.F.T.)**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 134 | 179 | 268 | 615 | 548 | 840 | 1153 | 98·9 |

Control yield=1625 Kg/ha ; No. of trials=8.

**N.Kanara**

**63(S.F.T.)**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 296 | 146 | 290 | 538 | 664 | 1127 | 1294 | 47·7 |

Control yield=3361 Kg/ha ; No. of trials=13.

**64(S.F.T.)**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 362 | 235 | 389 | 690 | 849 | 1245 | 1466 | 46·9 |

Control yield= 3509 Kg/ha. ; No. of trials=30.

**65(S.F.T.)**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 352 | 276 | 416 | 754 | 965 | 1277 | 1488 | 49·3 |

Control yield=2760 Kg/ha. ; No. of trials=26.

**Shimoga**

**63(S.F.T.)**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 151 | 117 | 217 | 315 | 365 | 463 | 559 | 24·7 |

Control yield=2542 Kg/ha ; No. of trials=14.

**Crop :- Paddy (*Rabi*).**

**Ref :- Ms. 62(SFT) for Mysore ; 62,63, (SFT) for N. Kanara and 63, 64 (SFT) for S. Kanara.**

**Site :- (District) : Mysore, N. Kanara, and S. Kanara.**

**Type :- 'M'.**

Object : —Type $A_3$—To study the response curves of important cereal, cash and oilseed crops to Potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Laterite for N. Kanara and S. Kanara and Red sandy for Mysore (iii) to (vi) N.A. (vii Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments
O=Control (no manure)
$N_1$=35 Kg/ha. of N
$K_1$=35 Kg/ha. of $K_2O$
$K_2$=70 Kg/ha. of $K_2O$
$N_1K_1$=35 Kg/ha. of N+35 Kg/ha. of $K_2O$
$N_1K_2$=35 Kg/ha. of N+70 Kg/ha. of $K_2O$
$N_2K_2$=70 Kg/ha. of N+70 Kg/ha. of $K_2O$
$N_1P_1K_1$=35 Kg/ha. of N+35 Kg/ha. of $P_2O_5$+35 Kg/ha. of $K_2O$
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in type $A_1$ (*Rabi*) on page 65.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962– only for Mysore ; 1962, 1963 for N. Kanara and 1963 to 1964 for S. Kanara. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

**Mysore**

62(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 803 | 658 | 812 | 1099 | 1944 | 756 | 1372 | 156·5 |

Control yield=2083 Kg/ha ; No. of trials=4.

**N. Kanara**

62(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 414 | 157 | 120 | 504 | 483 | 683 | 716 | 44·2 |

Control yield=1577 Kg/ha ; No. of trials=8.

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 482 | 173 | 243 | 607 | 695 | 883 | 934 | 92·5 |

Control yield=2170 Kg/ha ; No. of trials=9.

**S. Kanara**

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha: | 309 | 249 | 238 | 403 | 477 | 588 | 675 | 58·8 |

Control yield=1120 Kg/ha ; No. of trials=9.

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 294 | 244 | 201 | 374 | 504 | 643 | 569 | 101·5 |

Control yield=1098 Kg/ha ; No. of trials=4.

**Crop :- Paddy** (*Kharif*).

**Ref :-** Ms. 62, **(SFT) for Banglore ; 65 (SFT) for Bellary and** Mandya ; **63, 64 (SFT) for Chikmagalur and** Mysore ; **63 (SFT) for Hassan, and N. Kanara and 64 (SFT) for Shimoga.**

**Site :- (District) : Banglore, Bellary, Chikmagalur, Hassan,** Mandya, Mysore, **N. Kanara and Shimoga.**

**Type :-** 'M'.

Object :— Type $A_3$—To study the response curves of important cereal, cash and oilseed crops to Potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red loamy for Banglore ; Loamy for Chikmagalur ; Laterite for N. Kanara and Red sandy for others. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2 TREATMENTS : and 3. DESIGN :

Same as in type $A_3$ (Rabi)on page 75.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962 to 1966 [1963 to 1965 N.A.] for Banglore ; 1965—only for Bellary ; 1963, 1964 for Chikmagalur ; 1963 to 1966 [1964 and 1965 N.A. for Hassan and N. Kanara and 1965 N.A. for Mysore] for Hassan, Mysore and N. Kanara 1965 to 1966 for Mandya and 1964-only for Shimoga. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**Banglore**

62(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 707 | —23 | 184 | 714 | 392 | 807 | 430 | 153·3 |

Control yield=1990 Kg/ha. ; No. of trials=3.

**Bellary**

65(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 681 | 276 | 423 | 849 | 876 | 1257 | 1100 | 86·0 |

Control yield=2560 Kg/ha. ; No. of trials=8.

**Chikmagalur**

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 189 | —49 | 444 | 864 | 897 | 2635 | 1696 | 172·0 |

Control yield=1581 Kg/ha. ; No. of trials=4.

54(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 520 | 467 | 674 | 919 | 1261 | 1822 | 2306 | 118·4 |

Control yield=1910 Kg/ha. ; No. of trials=22.

**Hassan**

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 221 | 22 | 186 | 389 | 314 | 620 | 547 | 104·6 |

Control yield=2088 Kg/ha ; No. of trials=5.

**Mandya**

65(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 908 | 975 | 1050 | 1133 | 1554 | 1991 | 1295 | 127·3 |

Control yield=3866 Kg/ha ; No. of trials=8.

**Mysore**

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 433 | 9 | 175 | 262 | 341 | 413 | 855 | 118·6 |

Control yield=2333 Kg/ha ; No. of trials=10.

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 737 | 545 | 784 | 1131 | 1082 | 1063 | 1801 | 205·4 |

Control yield=3557 Kg/ha ; No. of trials=13.

**N. Kanara**

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 470 | 240 | 448 | 560 | 582 | 851 | 772 | 145·0 |

Control yield=3726 Kg/ha ; No. of trials=4.

**Shimoga**

**64(S.F.T.)**

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 1877 | 48 | 1031 | 1549 | 1226 | 1932 | 2188 | 634·1 |

Control yield=3120 Kg/ha ; No. of trials=3.

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**Crop :- Paddy** (*Kharif*).

**Ref :-** Ms. 63, 64 **(SFT) for Belgaum, 63 (SFT) for Hassan, Chikmagalur and Shimoga 64(SFT) for Mandya and S. Kanara ; 63, 64, 65, (SFT) for N. Kanara.**

**Site :- (District) : Belgaum, Chikmagalur, Hassan, Mandya, N. Kanara, Shimoga & S. Kanara.**

**Type :** 'M'.

Object :—Type $A_3$—To study the response curves of important cereal, cash and oilseed crops to Potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Deep black for Belgaum ; Red loamy for Chikmagalur ; Laterite for N. Kanara and S. Kanara ; Red sandy for others. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS : and 3. DESIGN:

Same as in type $A_3$ (Rabi) on page 75.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1963 to 1964 for Belgaum ; 1963—only for Chikmagalur, Shimoga and Hassan 1964—only for Mandya and S. Kanara ; 1963 to 1966 for N. Kanara. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

**Belgaum**

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 316 | 124 | 149 | 405 | 393 | 572 | 687 | 83·4 |

Control yield=2335 Kg/ha ; No. of trials=7.

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 419 | 169 | 177 | 392 | 400 | 743 | 528 | 135·9 |

Control yield=2313 Kg/ha ; No of trials=5.

**Chikmagalur**

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 438 | 437 | 684 | 879 | 1166 | 1978 | 1921 | 147·3 |

Control yield=2226 Kg/ha. ; No. of trials=14.

**Hassan**

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 179 | 202 | 313 | 492 | 493 | 638 | 986 | 71·5 |

Control yield=1599 Kg/ha. ; No. of trials=8.

**Mandya**

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 197 | 444 | 444 | 395 | 370 | 444 | 741 | 253·3 |

Control yield=6671 Kg/ha. ; No. of trials=2.

**N. Kanara**

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 393 | 136 | 278 | 619 | 747 | 984 | 1157 | 49·3 |

Control yield=3218 Kg/ha. ; No. of trials=14.

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 330 | 170 | 290 | 510 | 660 | 950 | 870 | 32·0 |

Control yield=3350 Kg/ha. ; No. of trials=30.

65(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 336 | 170 | 267 | 538 | 684 | 999 | 1153 | 45·2 |

Control yield=2640 Kg/ha. ; No. of trials=26.

**Shimoga**

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 174 | 135 | 288 | 350 | 395 | 494 | 556 | 29·6 |

Control yield=2713 Kg/ha ; No. of trials=14.

**S. Kanara**

64 (S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S·E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 428 | 220 | 376 | 533 | 513 | 683 | 703 | 112·2 |

Control yield=1078 Kg/ha ; No. of trials=3.

**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 64(64).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'MV'.**

Object :—To find out suitable variety, optimum dose and the time of application of fertilizer to summer Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) Nil. (ii) Clay loam. (iii) 12 and 13 2.1964. (iv) (a) Ploughing and puddling. (b) Transplanting. (c) —. (d) 25 cm. × 25 cm. (e) 2. (v) 24·7 C.L./ha. of F.Y.M.+ 44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$. (vi) As per treatments. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) May, June, 1964.

2. TREATMENTS :

Main-plot treatments

All combinations of (1) and (2) with control (2 plots)

(1) 4 levels of N : $N_1$=33·6, $N_2$=67·2, $N_3$=100·9 and $N_4$=134·5 Kg/ha.

(2) 4 times of application of N : $T_1$=A transplanting, $T_2$=70 % at transplanting, 20% one month after and 10% at flowering, $T_3$=half, At transplantings+half one month after transplanting, $T_4$=Half at transplanting+$\frac{1}{4}$th one month after and $\frac{1}{4}$th at flowering.

Sub-plot treatments :

3 varieties : $V_1$=S—2 2 2 2, $V_2$=T—65 and $V_3$=H—1043.

3. DESIGN :

(i) Split-plot. (ii) (a) 18 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 6·1 m. × 3·1 m. (b) 5·1 m. × 2·0 m. (v) 51 cm. × 51 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) In secticides and fungicides were sprayed as preventive measure. (iii) Yield of grain. (iv) (a) to (c) NO. (v) to (vii) Nil.

5. RESULTS :

(i) 5101 Kg/ha. (ii) (a) 1097·2 Kg/ha. (b) 723·4 Kg/ha. (iii) V effect and control vs. treatments are highly significant. T effect and interaction V×N are significant. (iv) Av. yield of grain in Kg/ha.

Control mean=4328 Kg/ha.

| | $N_1$ | $N_2$ | $N_3$ | $N_4$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $V_1$ | 4346 | 4991 | 5132 | 4940 | 4630 | 5079 | 4928 | 4772 | 4852 |
| $V_2$ | 5289 | 5365 | 5896 | 5905 | 5536 | 5440 | 5604 | 5875 | 5614 |
| $V_3$ | 5176 | 5517 | 5094 | 4713 | 4897 | 5132 | 5257 | 5214 | 5125 |
| Mean | 4937 | 5291 | 5374 | 5186 | 5021 | 5217 | 5263 | 5287 | 5197 |
| $T_1$ | 5062 | 4746 | 4912 | 5364 | | | | | |
| $T_2$ | 4981 | 5606 | 5748 | 4533 | | | | | |
| $T_3$ | 5135 | 5360 | 5399 | 5158 | | | | | |
| $T_4$ | 4570 | 5452 | 5438 | 5689 | | | | | |

C.D. for T marginal means =525·4 Kg/ha.
C.D. for V marginal means =294·6 Kg/ha.
C.D. for V means at the same level of N=589·2 Kg/ha.
C.D. for N means at the same level of V=712·4 Kg/ha.
C.D. for control vs. others =557·4 Kg/ha.

**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 64(65).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'MV'.**

Object : –To find out suitable variety, optimum dose and time of application of fertilizer to Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) Nil. (ii) Clay loam. (iii) 8.7.64/12 and 13.8.64. (iv)(a) Ploughing and puddling. (b) Transplanting. (c) —. (d) 25 cm.×25 cm. (e) 2. (v) 24.7 C.L./ha. of F.Y.M.+ 44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$. (vi) As per treatments. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 29.12.64.

2. TREATMENTS and 3. DESIGN :

Same as in expt. no. 64(64)) on page 80.

4. GENERAL :

(i) Fair. (ii) Affected by blast. (iii) Yield of grain. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 3279 Kg/ha. (ii) (a) 657·8 Kg/ha. (b) 830·4 Kg/ha. (iii) Main effects of T is significant. Main effects of N, V and interaction V×N are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $N_1$ | $N_2$ | $N_3$ | $N_4$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $V_1$ | 3484 | 3061 | 2739 | 2356 | 2686 | 2859 | 2875 | 3220 | 2910 |
| $V_2$ | 4850 | 4896 | 4898 | 5540 | 4551 | 4936 | 5204 | 5493 | 5046 |
| $V_3$ | 2509 | 1916 | 1807 | 1323 | 1880 | 1838 | 1799 | 2038 | 1889 |
| Mean | 3614 | 3291 | 3148 | 3073 | 3039 | 3211 | 3293 | 3584 | 3282 |
| $T_1$ | 3588 | 3197 | 2553 | 2818 | | | | | |
| $T_2$ | 3634 | 3154 | 3102 | 2954 | | | | | |
| $T_3$ | 3530 | 3070 | 3366 | 3204 | | | | | |
| $T_4$ | 3705 | 3745 | 3571 | 3316 | | | | | |

C.D. for N or T marginal means =315·0 Kg/ha.
C.D. for V marginal means =338·2 Kg/ha.
C.D. for V means at the same level of N=676·3 Kg/ha.
C.D. for N means at the same level of V=635·8 Kg/ha,

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**Crop :- Paddy (*Ist crop*).** **Ref :- Ms. 62(26).**

**Site :- Paddy Breeding Stn , Mangalore.** **Type :- 'MV'.**

Object : – To find out the varietal response to increased levels of N.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy - Kolingi. (b) Kolingi. (c) Nil. (ii) Laterite, loamy in texture. (iii) 20.6.62. (iv) (a) 6 ploughings, 3 puddlings and levelling. (b) Transplanting. (c) 18 Kg/ha (d) 25 cm.×23 cm. (e) 3. (v) G.L. at 568 Q/ha.+34 Kg/ha. of $P_2O_5$ as Super+28·4 Kg/ha. of $K_2O$ as Mur. Pot. with A/S top dressing (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 356 cm. (x) 13.9.62 ; 3/10/62 and 8.10.62.

2. TREATMENTS :

**Main-plot treatments**

4 levels of N as A/S : $N_1$=22·2, $N_2$=44·5, $N_3$=66·7 and $N_4$=89·0 Kg/ha.

**Sub-plot treatments :**

5 varieties : $V_1$=MGL—1 (medium), $V_2$=MGL—5 (medium), $V_3$=PTB—9 (medium), $V_4$=PTB—10 (short) and $V_5$=MTU—3 (medium).

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication, 5 sub-plots/main-plot. (b) 33·5 m.×9·1 m. (iii) 4. (iv) (a) and (b) 7·9 m.×1·6 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Incidence of blast disease seen on $V_2$ controlled by spraying Fytolan. (iii) Grain and straw yield. (iv) (a) 1962 –63 (Treatments were modified in 1963). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2618 Kg/ha. (ii) (a) 445·4 Kg/ha. (b) 395·0 Kg/ha. (iii) Main effect of V is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | $V_3$ | $V_4$ | $V_5$ | Mean |
|---|---|---|---|---|---|---|
| $N_1$ | 1955 | 2493 | 3005 | 2671 | 2183 | 2461 |
| $N_2$ | 2416 | 2716 | 3180 | 2852 | 2300 | 2693 |
| $N_3$ | 2590 | 2587 | 3291 | 2664 | 2148 | 2656 |
| $N_4$ | 2570 | 2792 | 3198 | 2624 | 2117 | 2660 |
| Mean | 2383 | 2647 | 3168 | 2703 | 2187 | 2618 |

C.D. for V marginal means=281·0 Kg/ha.

**Crop :- Paddy (*Ist crop*).** **Ref :- Ms. 63(14).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'MV'.**

Object :—To study the varietal response to the increased levels of N.

1. BASAL CONDITIONS :

(i) (a) Paddy—paddy,—G.M. (b) G.M. (c) Nil. (ii) Laterite loamy in texture. (iii) 16.5.63/9.6.63. (iv) (a) Ploughings 5 to 6 rounds and levelling. (b) Transplanting. (c) 18 Kg/ha. (d) 25 cm.×23 cm. (e) 3. (v) G.L. at 56·8 Q/ha.+34 Kg/ha. of $P_2O_5$ as super+28·4 Kg/ha. of $K_2O$ as Mur. Pot. (vi) As per treatments. (vii) Rainfed. (viii) 1 intercultivation. (ix) 264 cm. (x) 17.9.63 to 3.10.63.

2. TREATMENTS :

**Main-plot treatments :**

4 levels of N as A/S : $N_1$=22·2, $N_2$=44·5, $N_3$=66·7 and $N_4$=100·1 Kg/ha.

**Sub-plot treatments :**

5 varieties : $V_1$=MGL—2 (medium), $V_2$=MGL—5 (medium), $V_3$=PTB—9 (medium), $V_4$=PTB—10 (short) and $V_5$=MTU—3 (medium).

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication, 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 7·92 m.×1·83 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) All varieties except PTB-10 had fair stand. (ii) 'blast observed' with early staged and was controlled by dusting time ceresan dust. (iii) Tiller counts, grain and straw yield. (iv) (a) 1962—1963 (treatments were modified in 1963). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3289 K/ha. (ii) (a) 374·8 Kg/ha. (b) 340·3 Kg/ha. (iii) V effect alone is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | $V_3$ | $V_4$ | $V_5$ | Mean |
|---|---|---|---|---|---|---|
| $N_1$ | 3827 | 3086 | 3119 | 2738 | 3186 | 3191 |
| $N_2$ | 4033 | 3120 | 3302 | 2967 | 3152 | 3315 |
| $N_3$ | 4218 | 3200 | 3379 | 2891 | 3236 | 3385 |
| $N_4$ | 3981 | 3000 | 3398 | 2865 | 3086 | 3266 |
| Mean | 4015 | 3102 | 3300 | 2865 | 3165 | 3289 |

C.D. for V marginal means = 242·1 Kg/ha.

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**Crop :- Paddy.** **Ref :- Ms. 63(15), 64(8).**
**Site :- Paddy Breeding Stn., Mangalore.** **Type- 'MV'.**

Object :—To study the varietal response to increased levels of N.

1. BASAL CONDITIONS :

(i) (a) Paddy—G.M.—Paddy. (b) Paddy. (c) G.L. at 56·8 Q/ha.+34 Kg/ha. of $P_2O_5$ as Super+ 28·4 Kg/ha. of $K_2O$ as Mur. Pot.+11·4 Kg/ha. of N as Urea+22·7 Kg/ha. of N as A/S. (ii) Laterite loamy in texture. (iii) 16.10.63 ; 17 9.64./28.10.64. (iv) (a) 5 to 6 ploughings, puddling and levelling. (b) Transplanting. (c) 18 Kg/ha. (d) 25 cm.×20 cm. (e) N.A. (v) G,L at 56·8 Q/ha.+34 Kg/ha. of $P_2O_5$ as Super+28·4 Kg/ha. of $K_2O$ as Mur. Pot 63(15).F.Y.M. at 123·6 Q/ha.+34 Kg/ha.ot $P_2O_5$ as Super+28·4 Kg/ha. $K_2O$ as Mur.Pot+Top dressing with N for 64(8). (vi) As per treatments. (vii) Irrigated. (viii) 1 intercultivation. (ix) 41 cm. ;28 cm. (x) 9, 17 and 31. 1. 64 ; 23. 1. 65 ; 9. 2. 65 and 4. 3. 65.

2. TREATMENTS :

Strips in one direction :
4 levels of N as A/S : $N_0$=0, $N_1$=24.7, $N_2$=49·4 and $N_3$=73·1 Kg/ha.
Strips in perpendicular direction :
3 varieties : $V_1$=M.G. L—7 (medium), $V_2$=PTB—20 (short) and $V_3$=CO—25 (long duration).

3. DESIGN :

(i) Strip—plot. (ii) (a) 4 strips in one direction ; 3 strips in perpendicular direction. (b) N.A. (iii) 4. (iv) (a) and (b) 9·1 m.×3·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Early incidence of leaf-roller which was controlled by spraying folidol. (iii) Yield of grain. (iv) (a) 1963—1964. (b) No. (c) Nil. (v) to (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent.

5. RESULTS ;

63(15).

(i) 2905 Kg/ha. (ii) (a) 466·0 Kg/ha. (b) 484·7 Kg/ha. (c) 111·6 Kg/ha. (iii) V effect is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | Mean |
|---|---|---|---|---|---|
| $V_1$ | 2939 | 2847 | 2913 | 2852 | 2888 |
| $V_2$ | 2340 | 2444 | 2139 | 2406 | 2332 |
| $V_3$ | 3065 | 3721 | 3513 | 3677 | 3494 |
| Mean | 2782 | 3004 | 2855 | 2978 | 2905 |

C. D for V marginal means=419·4 Kg/ha.

64(8).

(i) 3583 Kg/ha. (ii) (a) 501·2 Kg/ha. (b) 170·2 Ka/ha. (c) 235·0 Kg/ha. (iii) Main effects of N, V and interaction N×V are significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | Mean |
|---|---|---|---|---|---|
| $V_1$ | 2847 | 3209 | 3418 | 2860 | 3084 |
| $V_2$ | 3117 | 3886 | 4398 | 4598 | 4000 |
| $V_3$ | 3141 | 3645 | 4011 | 3862 | 3665 |
| Mean | 3035 | 3580 | 3943 | 3773 | 3583 |

C.D for N marginal means =462·9 Kg/ha.
C·D for V marginal means =104·1 Kg/ha.
C.D for V means at the same level of N=156·0 Kg/ha.
C.D for N means at the same level of V=245·5 24/ha.

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**Crop :- Paddy** (*Rabi*). **Ref :- Ms. 65(33).**
**Site :- Agri. Res. Stn., Mangalore.** **Type 'MV'.**

Object :—To study the varietal response to increased levels of N during second crop.

1. BASAL CONDITIONS :

(i) (a) Paddy— Paddy. (b) Paddy. (c) N.A. (ii) Sandy soil. (iii) 23.9.65/4.11.65. (iv) (a) 5 ploughings and puddling. (b) Transplanting. (c) 37 Kg/ha. (d) 20 cm.×20 cm. (e) 3. (v) 50 Q/ha.of F.Y.M. (vi) As per treatments. (vii) Irrigated. (viii) Hand weeding. (ix) 334·4 cm. (x) 27.1.66.

2. TREATMENTS :

**Main-plot treatments :**

4 levels of N : $N_0=0$, $N_1=24·7$, $N_2=49·4$ and $N_3=74·1$ Kg/ha.

**Sub-plot treatments :**

3 varieties : $V_1=C_o$ 25, $V_2$=MGL—7 and $V_3$=P.T.B.—20.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 9·1 m.×3·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) to (c) No. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2324 Kg/ha. (ii) (a) 372·2 Kg/ha. (b) 302·4 Kg/ha. (iii) Main effect of V is highly significant. Interaction N×V is significant. (iv) Av. yield of grain in Kg/hn.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | Mean |
|---|---|---|---|---|---|
| $V_1$ | 2145 | 2164 | 2328 | 2938 | 2394 |
| $V_2$ | 2153 | 1874 | 2087 | 2099 | 2053 |
| $V_3$ | 2573 | 2577 | 2573 | 2375 | 2525 |
| Mean | 2290 | 2205 | 2329 | 2471 | 2324 |

C.D for V marginal means =220·7 Kg/ha.
C.D for V means at the same level of N=441·4 Kg/ha.
C.D for N means at the same level of N =563·8 Kg/ha.

**Crop :- Paddy** (*Kharif*) **Ref :- Ms. 65 (10)**

**Site :- Agri. res. stn. Ponempet.** **Type 'M'.**

Object :—To find and the maximum dose of N and the best variety at which the paddy crop will be free from blast.

1. BASAL CONDITIONS :

(i) (a) Paddy after Paddy. (b) Paddy. (c) N.A. (ii) Sandy loam (iii) 17.6.65/22.7.65. (iv) (a) 2 ploughings and levelling. (b) Transplanting. (c) —. (d) 25 cm. ×25 cm. (e) 2 to 4. (v) 22·4 Kg/ha. of Super +67·2 Kg/ha. of Potassium Chloride+22·2 C.L./ha. of F.Y.M-+106·4 Q/ha. of G.L. (vi) As per treatments. (vii) Unirrigated. (viii) 2 hand weedings. (ix) 149·4 cm. (x) 22.12.65.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 5 varieties : $V_1$=Andrew soil, $V_2$=P.S. 1, $V_3$=K.B. 356, $V_4$=M.B. 319 and $V_5$=S. 67.

(2) 4 levels of N : $N_1$=22·4, $N_2$=33·6, $N_3$=50·4 and $N_4$=67·2 Kg/ha.

Seedlings were dropped in blitox solution before transplanting.

3. DESIGN :

(i) Fact in R.B.D. (ii) (a) 20. (b) 32·8 m.×20·1 m. (iii) 3, (iv) (a) 6·9 m.×5·0 m. (b) 6·4 m.×4·6 m. (v) and (vi) Yes.

4. GENERAL :

(i) Lodging in some of the Plots. (ii) Slight neck infection noticed. Blast-sprayed with blitox. (iii) Yield of grain. (iv) (a) to (c) No. (v) N:A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1428 Kg/ha. (ii) 446·3 Kg/ha. (iii) Main effect of V is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | $V_3$ | $V_4$ | $V_5$ | Mean |
|---|---|---|---|---|---|---|
| $N_1$ | 1854 | 1155 | 1006 | 1394 | 1867 | 1455 |
| $N_2$ | 1597 | 1358 | 1052 | 1280 | 1622 | 1382 |
| $N_3$ | 1988 | 1052 | 1269 | 1222 | 1665 | 1439 |
| $N_4$ | 1732 | 1082 | 1269 | 1246 | 1850 | 1436 |
| Mean | 1793 | 1162 | 1149 | 1285 | 1751 | 1428 |

C.D. for V marginal means=369·0 Kg/ha-

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**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 63(48).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'M'.**

Object :—To study the effect of drilling vs. Broadcasting vs. Transplanting on Paddy.

1. BASAL CONDITIONS :

(i) (a) Ragi, Groundnut or Caster—Paddy. (b) Groundnut. (c) 49 C.L./ha. of F.Y.M. (ii) Red sandy soil. (iii) 17.7.63/20.8.63. (iv) (a) 2 ploughings and 2 harrowings. (b) As per treatments. (c) to (e) N.A. (v) 8·9 Kg/ha. of N as A/S+7·9 Kg/ha. of $P_2O_5$ as Super. (vi) S-661. (vii) Irrigated. (viii) Weeding and gap filling. (ix) 60 cm. (x) 11,12.11.63, 4.12.63.

2. TREATMENTS :

3 methods of sowing : $M_1$=Drilling, $M_2$=Broadcasting and $M_3$=Transplanting.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 12·8 m.×9·5 m. (iii) 8. (iv) (a) and (b) 9·5 m.×4·3 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) More lodgings were found in broadcasted plots. (ii) Nil. (iii) Grain and straw yield. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 2025 Kg/ha. (ii) 344 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ |
|---|---|---|---|
| Av. yield | 2263 | 1651 | 2162 |

C.D.=357·8 Kg/ha.

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 61(56), 62(48).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'C'.**

Object :—To find out optimum spacing for transplanted Paddy.

1. BASAL CONDITIONS :

Paddy– Paddy. (b) Paddy. (c) 75·3 Q/ha. of Compost for 61(56) and G.M. at 2242 Kg/ha.+22·4 Kg/ha. of N as Urea+33·6 Kg/ha. of $P_2O_5$+11·2 Kg/ha. of N for 62(48). (ii) Clay loam. (iii) 27.6.61/1.8.61 ; 10.7.62. (iv) (a) 3 ploughings and puddling. (b) Transplanting. (c) 34 Kg/ha. (d) As per treatments. (e) 3. (v) Sesbania G.M. at 2242 Kg/ha.+22·4 Kg/ha. of N as Urea+35·9 Kg/ha. of $P_2O_5$ as Super+11·2 Kg/ha. of N as A/S. (vi) S. 199. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. ; 67 cm. (x) 11.12.61 ; 16.12.61.

2. TREATMENTS :

4 spacing treatments : $S_1$=25 cm.×15 cm., $S_2$=25 cm.×20 cm., $S_3$=25 cm.×25 cm, and $S_4$=25 cm.×30 cm.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. ; 32·9 m.×13·7 m. (iii) 4 ; 6. (iv) (a) 10·1 m.×10·1 m. ; 8·2 m.×13·7 m. (b) 10·1 m.×10·1 m. ; 7·6 m.×13·1 m. (v) Nil ; 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 to 1962. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent. Results of the individual experiments are presented below.

5. RESULTS :

**61(56)**

(i) 3950 Kg/ha. (ii) 55·9 Kg/ha. (iii) Treatment differences are highly siguificant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $S_1$ | $S_2$ | $S_3$ | $S_4$ |
|---|---|---|---|---|
| Av. yield | 3990 | 4058 | 3921 | 3833 |

C.D.=89·4 Kg/ha.

**62(48)**

(i) 3786 Kg/ha. (ii) 484·5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatments | $S_1$ | $S_2$ | $S_3$ | $S_4$ |
|---|---|---|---|---|
| Av. yield | 3706 | 3686 | 3861 | 3891 |

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**Crop :- Paddy** (*First crop*). **Ref :- Ms. 60(52), 61(20).**

**Site :- Paddy Breeding Stn., Mangalore. Type :- 'C'.**

Object :—To find out the optimum spacing and role of interculture on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—G.M. (b) G.M. (c) Nil. (ii) Laterite, loamy in texture. (iii) 8.7.60; 3.7.61. (iv) (a) 4—6 ploughings. (b) Transplanting. (c) 67 Kg/ha. (d) As per treatments. (e) 2—4. (v) G.M. at 5604 Kg/ha.+N, P and K each at 33·6 Kg/ha. in 60(52), G.L. at 2965 Kg/ha.+34 Kg/ha. of $P_2O_5$ as Super +28·4 Kg/ha. of $K_2O$ as Mur. Pot.+11·4 Kg/ha. of N as Urea+22·7 Kg/ha. of N as A/S top-dressed. (vi) MGL—1. (vii) Unirrigated. (vii) 2 weedings. (ix) 181 cm.; 531 cm. (v) 23.10.60 ; 26.10.61.

2. TREATMENTS :

All combinations of (1) and (2)+an extra treatments.

(1) 4 spacings : $S_1$=20 cm.×10 cm., $S_2$=20 cm.×20 cm., $S_3$=25 cm.×10 cm. and $S_4$=25 cm.×25 cm.

(2) 2 levels of interculturings : $I_0$=0 and $I_1$=interculturings (exact no. of intercultures is N.A.)

Extra treatment : E=Bulk planting by Ryots method.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 4·2 m.×3·2 m.for 60(52), 4·1 m.× 3·1 m. for 61(20). (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Mild attack of blast and moderate incidence of gall-fly. Spraying with 'paramar' and dusting with ceresan dust in 61(20). (iii) Yield of grain. (iv) (a) 1959—1961 (modified in 1960). (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 2528 Kg/ha. (ii) 247·4 Kg/ha. [based on 56 d.f. made up of Treatments×years interaction and pooled error]. (iii) E vs. others is highly significant. (iv) Av. yield of grain in Kg/ha.

E=2295 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $I_0$ | 2486 | 2418 | 2739 | 2440 | 2521 |
| $I_1$ | 2528 | 2593 | 2670 | 2580 | 2593 |
| Mean | 2507 | 2506 | 2704 | 2510 | 2557 |

C.D. for E vs. others=186·8 Kg/ha.

| Years | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Sig | $I_0$ | $I_1$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 2397 | 2320 | 2511 | 2258 | N.S. | 2339 | 2404 | N.S. | 2345 | 210·1 |
| 1961 | 2616 | 2692 | 2898 | 2762 | N.S. | 2703 | 2782 | N.S. | 2710 | 279·7 |
| Pooled | 2507 | 2506 | 2704 | 2510 | N.S. | 2521 | 2593 | N.S. | 2528 | 247·4 |

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**Crop :- Paddy (*First Crop*).** **Ref :- Ms. 60(48), 61(25).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'C'.**

Object: —To find out maximum spacing and role of interculturing on the yield of Paddy.

1. BASAL CONDITIONS:

(i) (a) Paddy—Paddy and G.M. (b) G.M. (c) Nil. (ii) Laterite, loamy in texture. (iii) 9/10.6.60 ; 6.7.61. (iv) (a) 4 to 5 ploughings. (b) Transplanting. (c) 67 Kg/ha. for 60(48) ; Nil. (d) As per treatments. (e) 2 to 4. (v) F.Y.M. at 56 Q/ha.+33·6 Kg/ha. of N as A/S+33·6 Kg/ha. of $P_2O_5$ as Super +33·6 Kg/ha.of $K_2O$ as Mur. Pot. for 60(48) and G.L. at 29 Q/ha.+34 Kg/ha. of $P_2O_5$ as Super+28·0 Kg/ha. of $K_2O$ as Mur. Pot.+11·4 Kg/ha. of N as Urea+22·7 Kg/ha. of N as A/S top dressed for 61(25). (vi) P.T.B. 9 (late). (vii) Unirrigated. (viii) 2 weedings ; Nil. (ix) 181 cm. ; 547 cm. (x) 7.10.60 ; 18.10.61.

2. TREATMENTS :

Same as in expt. no. 60(52) on page 87.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A ; 4·1 m×29·9 m. (iii) 4. (iv) (a) and (b) 6·2 m×3·2 m ; 3·1 m×4·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil ; Attack of gall-fly and leaf-roller. (iii) Grain yield. (iv) 1959—1961 (modified in 1960) (b) No. (c) Nil. (v) and (vi) Nil. (vii) As the error variances are heterogeneous and Treatments×years interaction is absent, results of the individual experiments are presented below.

5. RESULTS :

**60(48)**

(i) 2643 Kg/ha. (ii) 264·7 Kg/ha. (iii) E vs. other is highly significant. (iv) Av. yield of grain in Kg/ha.

E=2207 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $I_0$ | 2585 | 2869 | 2743 | 2496 | 2673 |
| $I_1$ | 2520 | 2879 | 2567 | 2916 | 2720 |
| Mean | 2552 | 2874 | 2655 | 2706 | 2697 |

C.D for E vs. others=89·8 Kg/ha.

**61(25).**

(i) 2629 Kg/ha. (ii) 401·3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

E=2720 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $I_0$ | 2656 | 2515 | 2785 | 2474 | 2607 |
| $I_1$ | 2550 | 2819 | 2790 | 2352 | 2628 |
| Mean | 2603 | 2667 | 2788 | 2413 | 2618 |

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**Crop :- Paddy** (*First Crop*). **Ref :- Ms 60(49), 61(22):**

**Site :- Paddy Breeding Stn., Mangalore.** **Type 'C'.**

Object :—To find out optimum spacing and role of interculture on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) G.M, – Paddy. (c) N.A. (ii) Laterite loamy in texture. (iii) 22.6.60 ; 29.6.61. (iv) (a) 4 ploughings. (b) Transplanting. (c) 67 Kg/ha. (d) As per treatments. (e) 2 to 4. (v) FYM at 56 Q/ha. +N, P and K each at 33·6 Kg/ha. for 60(49) ; G.L. at 296 Q/ha.+34 Kg/ha. of $P_2O_5$ as Super+28·4 Kg/ha. of $K_2O$ as Mur. Pot.+11·4 Kg/ha. of N as Urea+22·7 Kg/ha. of N as A/S top dressed for 61(22). (vi) MGL—3. (vii) Unirrigated. (viii) 2 weedings. (ix) 288 cm. ; 181 cm. (x) 31.10.60 ; 6.11.61.

2. TREATMENTS :

Same as in expt. no. 60(52) on page 87.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) 4·2 m.×3·2 m. for 60(49), 4·1 m.×3·5 m. for 61(22). (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Attack of stemborer. (iii) Yield of grain. (iv) (a) 1959—1961 (modified in 1960). (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treaments × Years interaction is absent.

5. RESULTS:

(i) 1651 Kg/ha. (ii) 237·5 Kg/ha. [based on 56 d.f. made up of Treatments × Years interaction and pooled error]. (iii) Main effect of S is significant. E vs. others is highly significant. (iv) Av. yield of grain in Kg/ha.

E=1349 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $I_0$ | 1544 | 1666 | 1630 | 1724 | 1641 |
| $I_1$ | 1605 | 1646 | 1786 | 1911 | 1737 |
| Mean | 1574 | 1656 | 1708 | 1818 | 1689 |

C.D. for S marginal means=169·0 Kg/ha.
C.D. for E vs. others =179·3 Kg/ha.

| Years | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Sig | $I_0$ | $I_1$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 1514 | 1626 | 1727 | 1784 | N.S. | 1701 | 1624 | N.S. | 1623 | 270·0 |
| 1961 | 1636 | 1686 | 1689 | 1851 | N.S. | 1581 | 1850 | ** | 1679 | 199·8 |
| Pooled | 1575 | 1656 | 1708 | 1818 | * | 1641 | 1737 | N.S. | 1651 | 237·5 |

**Crop :- Paddy (*First Crop*).** **Ref :- Ms. 60(50), 61(24).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'C'.**

Object :—To find the optimum spacing and role of interculturing on the yield of Paddy.

1. BASAL CONDITIONS :—

(i) (a) Paddy—Sweet potato ; Paddy—G.M. (b) Sweet potato ; G.M. (c) 56 Kg/ha of Lime+91 Kg/ha. of $P_2O_5$ as Super ; Nil. (ii) Laterite loamy in texture. (iii) 27.6.60 ; 9.6.61. (iv) (a) 4 to 6 ploughings. (b) Transplanting. (c) 67 Kg/ha. (d) As per treatments. (e) 2 to 4. (v) G.L at 44·8 Q/ha.+N, P and K each at 53 6 Kg/ha. for 60(50), G.L. at 29·6 Q/ha.+34 Kg/ha. of $P_2O_5$ as Super+28·4 Kg/ha of $K_2O$ as Mur. Pot+11·4 Kg/ha. of N as Urea+22·7 Kg/ha. of N as A/S for 61(24). (vi) MTU—3. (vii) Unirrigated. (viii) Weeding. (ix) 181 cm.; 588 cm. (x) 12.10.60 ; 20.10.61.

2. TREATMENTS :

Same as in expt no 60(52) on page 87.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 6·2 m.×3·2 m. for 60(50), 4·1 m.× 3·1 m. for 61(24). (v) Nil (vi) Yes.

4. GENERAL :

(i) Good. (ii) Moderate attack of 'Kane' controlled by spraying with Paramer for 61(24). (iii) Yield of grain. (iv) (a) 1959—1961 (modified in 1960). (b) No. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 2829 Kg/ha. (ii) 331·2 Kg/ha. [based on 56 d.f. made up of Treatments×Years interaction and pooled error]. (iii) Main effect of S is significant. E vs. others is significant. (iv) Av. yield ef grain in Kg/ha.

E=2593 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $I_0$ | 2924 | 2976 | 2680 | 2792 | 2843 |
| $I_1$ | 2858 | 3104 | 2722 | 2812 | 2874 |
| Mean | 2891 | 3040 | 2701 | 2802 | 2858 |

C.D. for S marginal means=235·7 Kg/ha.
C.D. for E vs. others =250·0 Kg/ha.

| Years | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Sig. | $I_0$ | $I_1$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 2650 | 2927 | 2594 | 2706 | N.S. | 2700 | 2738 | N.S. | 2683 | 361·7 |
| 1961 | 3132 | 3153 | 2808 | 2898 | N.S. | 2986 | 3010 | N.S. | 2975 | 297·5 |
| Pooled | 2891 | 3040 | 2701 | 2802 | * | 2843 | 2874 | N.S. | 2829 | 331·2 |

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**Crop :- Paddy.** **Ref :- Ms. 60(53), 61(21).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'C'.**

Object :—To find out the maximum spacing and role of interculture on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—G.M. (b) Kolingi. (c) Nil. (ii) Laterite, loamy in texture. (iii) 12.7.60 for 60(53) and 30.6.61 for 61(21). (iv) (a) 6 ploughings. (b) Transplanting. (c) 67 Kg/ha. (d) As per treatments. (e) 4 for 60(53) and 2 to 3 for 61(21). (v) G.M. at 56 Q/ha.+22·4 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super+33·6 Kg/ha. of $K_2O$ as Mur. Pot. for 60(53) and G.L. at 29 Q/ha.+34 Kg/ha. of $P_2O_5$ as Super+28·4 Kg/ha. of $K_2O$ as Mur. Pot.+11·4 Kg/ha. of N as Urea+22·7 Kg/ha. of N as A/S top dressed for 61(21). (vi) M.G.L. (medium). (vii) Unirrigated. (viii) 2 weeding for 60(53) and Nil for 61(21). (ix) 181·0 cm. for 60(53) and 547 cm. for 61(21). (x) 18.10.60 for 60(53) and 6.10.61 for 61(21).

2. TREATMENTS :

Same as in expt. no. 60(52) on page 87.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 3·2 m.×3·2 m. ; 3·1 m.×4·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Early attack of kane', spraying folidol for 60 and attack of gall-fly for 61. (iii) Tiller counts and grain yield. (iv) (a) 1959—1961 (59 N.A). (b) No. (c) Nil. (v) Nil. (vi) The crop suffered on account of draught during flowering stage for 60(53) and heavy rainfall was rather determined to the crop causing severe shedding for 61(21). (vii) Error variances are heterogeneous and Treatments×years interaction is absent, results of individual experiments are presented below.

5. RESULTS :

**60(53)**

(i) 2066 Kg/ha. (ii) 413·5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$\bar{E}$=2218 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $I_0$ | 1688 | 1953 | 1866 | 2150 | 1914 |
| $I_1$ | 1924 | 2197 | 2029 | 2572 | 2180 |
| Mean | 1806 | 2075 | 1948 | 2361 | 2047 |

**61(21)**

(i) 2600 Kg/ha. (ii) 243·2 Kg/ha. (iii) Main effect of S alone is significant. (iv) Av. yield of grain in Kg/ha.

$\bar{E}$=2426 Kg/ha.

| | $S_1$ | $S_2$ | $S_2$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $I_0$ | 2189 | 2646 | 2671 | 2780 | 2572 |
| $I_1$ | 2560 | 2886 | 2580 | 2659 | 2671 |
| Mean | 2374 | 2765 | 2625 | 2720 | 2622 |

C.D. for S marginal means=250·9 Kg/ha.

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**Crop :- Paddy (*1st crop*).** **Ref :- Ms. 60(51), 61(23).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'C'.**

Object :—To study the effect of optimum spacing and interculture on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (e) Paddy—paddy, G.M. (b) N.A. (c) Nil. (ii) Laterite, loamy in texture. (iii) 23.6.60 ; 5.6.61. (iv) (a) 4 ploughings. (b) Transplanting. (c) 67 Kg/ha. ; N.A. (d) As per treatments. (e) 2 to 4. (v) G.M. at 56 Q/ha.+33·6 Kg/ha. of N as 33·6 Kg/ha. of $P_2O_5$ as Super+33·6 Kg/ha. of $K_2O$ as Mur. Pot. for 60(51) and G.L. at 56·8 Q/ha. of $P_2O_5$ as Super+28·3 Kg/ha. of $K_2O$ as Mur. Pot.+22·7 Kg/ha. of N as A/S for 61(23). (vi) M.G.L.S. (vii) Unirrigated. (viii) 2 weedings ; Nil. (ix) 181 cm. ; 547 cm. (x) 27.9.60 ; 1.10.61.

2. TREATMENTS :

Same as in expt. no. 60(52) on page 87.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. ; 4·1 m.×29·9 m. (iii) 4. (iv) (a) and (b) 4·2 m.×3·2 m. ; 3·1 m. ×4·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Leaf roller attack ; Mild attack of Helminthosprorium. (iii) Yield of grain. (iv) (a) 1959 to 1961 (modified in 1960). (b) No. (c) Nil. (v) and (vi) Nil. (vii) As the variances are heterogeneous and the Treatments×years interaction is absent, results of individual experiments are presented below.

5. RESULTS :

60(51)

(i) 2808 Kg/ha. (ii) 420·1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

E=2646 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $I_0$ | 2973 | 2619 | 2943 | 2577 | 2778 |
| $I_1$ | 2637 | 3025 | 2849 | 3005 | 2879 |
| Mean | 2805 | 2822 | 2896 | 2791 | 2828 |

61(23)

(i) 2344 Kg/ha. (ii) 175·2 Kg/ha. (iii) (S×I) interaction is higly significant. (iv) Av. yield of grain in Kg/ha.

E=2303 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $I_0$ | 2609 | 2206 | 2339 | 2258 | 2353 |
| $I_1$ | 2179 | 2439 | 2370 | 2389 | 2344 |
| Mean | 2394 | 2322 | 2355 | 2323 | 2349 |

C.D. for the body of S×I table=255·7 Kg/ha.

**Crop :- Paddy** (*2nd crop*). **Ref :- Ms. 60(61), 61(27).**

**Site :- Paddy Breeding, Stn., Mangalore.** **Type :- 'C'.**

Object :—To find the optimum spacing and role of interculturing on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—G.M. (b) G.M. (c) Same as in 1·5. (ii) Laterite loamy in texture. (iii) 4.10.60 ; 7.10.61. (iv) (a) 5—6 ploughings. (b) Transplanting. (c) N.A. (d) As per treatments. (e) 4. (v) G.L. at 56 Q/ha.+N, P and K each at 33·6 Kg/ha. for 60(61) ; G.L. at 29·6 Q/ha.+Kg/ha. of $P_2O_5$ as Super+ 28·4 Kg/ha. of $K_2O$ as Mur. Pot.+11·4 Kg/ha. of N as Urea+22·7 Kg/ha. of N as A/S top dressed in 61(27). (vi) PTB—20. (vii) Unirrigated. (viii) Weeding. (ix) 37 cm.; 45 cm. (x) 9.1.61 ; 6.1.62.

2. TREATMENTS :

Same as in expt no 60(52) on page 87.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 4·1 m.×3·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Early attack of cane worms controlled by spraying Endrex in 60(61). Attack of leaf roller—sprayed with 'paramar'. (iii) Yield of grain. (iv) (a) 1960—1961. (b) No. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Tillers were nearly double in treatments with wider spacing in 61(27). Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 3084 Kg/ha. (ii) 263·7 Ks/ha. (based on 56 d. f. made up of treatmenrs×years interaction and pooled error). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

E=3212 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $I_0$ | 3192 | 3028 | 2952 | 3104 | 3069 |
| $I_1$ | 3046 | 3042 | 3134 | 3046 | 3067 |
| Mean | 3119 | 3035 | 3043 | 3075 | 3068 |

| Years | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Sig. | $I_0$ | $I_1$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 2866 | 2642 | 2792 | 2902 | N.S. | 2802 | 2797 | N.S. | 2794 | 216·2 |
| 1961 | 3376 | 3427 | 3294 | 3248 | N.S. | 3335 | 3338 | N.S. | 3375 | 303·9 |
| Pooled | 3119 | 3035 | 3043 | 3075 | N.S. | 3069 | 3067 | N.S. | 3084 | 263·7 |

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**Crop :- Paddy** (*2nd crop*). **Ref :- Ms. 60(64), 61(29).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'C'.**

Object :—To find out the role of interculture and optimum spacing on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy, G.M. (b) Paddy. (c) As under basal manuring. (ii) Laterite loamy in texture. (iii) 10.11.60 ; 23.11.61. (iv) (a) 5 to 6 ploughings. (b) Transplanting. (c) N.A. (d) As per treatments. (e) 4. (v) G.L. at 5604 Kg/ha.+N, P and K each at 33·6 Kg/ha. for 60(64) ; G.L. at 2965 Kg/ha. of $P_2O_5$ as Super+28·4 Kg/ha. of $K_2O$ as Mur. pot.+11·4 Kg/ha. of N as Urea+22·7 Kg/ha. of N as A/S top dressed. (vi) CO 25 (late). (vii) Unirrigated. (viii) Weeding. (ix) 37 cm.; 45 cm. (x) 10.2.61; 21.2.62.

### 2. TREATMENTS :

Same as in expt no. 60(52) on page 87.

### 3. DESIGN ;

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 4·1 m.×3·1 m. (v) Nil. (vi) Yes.

### 4. GENERAL :

(i) Satisfactory. (ii) Moderate attack of stem borer. (iii) Grain yield. (iv) (a) 1959—1961 (modified in 1960). (b) No. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

### 5. RESULTS :

(i) 2375 Kg/ha. (ii) 303·9 Kg/ha. (based on 56 d.f. made up of treatments×years interaction and pooled error.) (iii) Main effect of S is highly significant. (iv) Av. yield of grain in Kg/ha.

E=2400 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $I_0$ | 2388 | 2443 | 2436 | 2136 | 2351 |
| $I_1$ | 2720 | 2279 | 2382 | 2196 | 2394 |
| Mean | 2554 | 2361 | 2409 | 2166 | 2372 |

C.D. for S marginal means=216·3 Kg/ha.

| Years | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Sig. | $I_0$ | $I_1$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 2535 | 2392 | 2386 | 2319 | N.S. | 2376 | 2440 | N.S, | 2427 | 266·8 |
| 1961 | 2573 | 2329 | 2432 | 2014 | * | 2326 | 2349 | N.S. | 2324 | 337·0 |
| Pooled | 2554 | 2361 | 2409 | 2166 | N.S. | 2351 | 2394 | N.S. | 2375 | 303·9 |

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**Crop :- Paddy** (*2nd crop*). **Ref :- Ms. 60(63), 61(28).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'C'.**

Object :— To study the role of interculture and optimum spacing on the yield of Paddy.

### 1. BASAL CONDITIONS :

(i) (a) Paddy, G.M. (b) Paddy. (c) G.M. at 5604 Kg/ha.+34 Kg/ha. of $P_2O_5$ as Super+28 Kg/ha. of $K_2O$ as Mur. Pot.+33·6 Kg/ha. of N as A/S for 60(63) and G L. at 2965Kg/ha.+34 Kg/ha. of $P_2O_5$ as Super+28·4 Kg/ha. of $K_2O$ as Mur. Pot.+11·4 Kg/ha. of N as Urea+22·7 Kg/ha. of N as A/S top dressed for 61(28). (ii) Laterite, Loamy in texture. (iii) 29.10.60 ; 12.10.61. (iv) (a) 5 to 6 ploughings. (b) Transplanting. (c) N.A. (d) As per treatments. (e) 2 to 4. (v) Same as in [i(c)] above. (iv) CO. 14 (medium). (vii) Irrigated. (viii) Rotary weedings. (ix) 37 cm.; 45 cm. (v) 15.2.61 ; 3.2.62.

### 2. TREATMENTS :

Same as in expt no. 60(52) on page 87.

### 3. DESIGN :

(i) Fact. in R.B.D. (ii) 9. (b) N.A., 4·1 m.×29·9 m (iii) 4. (iv) (a) and (b) 3·1 m.×4·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Attack of stem borer and leaf roller attack. (iii) Tiller counts and grain yield. (iv) (a) 1959 to 1961 (modified in 1960). (b) No. (c) Nil. (v) and (vi) Nil. (vii) As the variances are heterogeneous and Treatments × Years interaction is absent, results of individual experiments are presented below :

5. RESULTS :

**60(63)**

(i) 2064 Kg/ha. (ii) 458·4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

E=2016 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $I_0$ | 2301 | 2091 | 2295 | 2022 | 2177 |
| $I_1$ | 1897 | 1893 | 2206 | 1879 | 1969 |
| Mean | 2099 | 1992 | 2250 | 1950 | 2070 |

**61(28)**

(i) 1859 Kg/ha. (ii) 302·9 Kg/ha. (ii) S effect is highly significant. (iv) Av. yield of grain in Kg/ha.

E=2111 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $I_0$ | 2187 | 1530 | 1843 | 1453 | 1753 |
| $I_1$ | 2076 | 1675 | 2076 | 1779 | 1902 |
| Mean | 2131 | 1602 | 1959 | 1616 | 1827 |

C.D. for S marginal means=312·6 Kg/ha.

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**Crop :- Paddy** *(2nd crop)*. **Ref :- Ms. 60(62), 61(26).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'C'.**

Object :— To study the role of interculture and optimum spacing on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy, G.M. (b) Paddy. (c) G.M. at 56 Q/ha.+34 Kg/ha. of $P_2O_5$ as Super+28 Kg/ha. of $K_2O$ as Mur. Pot.+38·6 Kg/ha. of N as A/S for 60(62) and G.L. at 29 Q/ha.+34 Kg/ha. of $P_2O_5$ as Super+28·4 Kg/ha. of $K_2O$ as Mur. Pot.+11·4 Kg/ha. of N as Urea+22·7 Kg/na. of N as A/S top dressed for 61(26). (ii) Laterite, loamy in texture. (iii) 31.10.60 ; 24.10.61. (iv) (a) 5 ploughings+2 levellings. (b) Transplanting. (c) N.A. (d) As per treatments. (e) 2 to 3. (v) Same as in [(i) (c)] above. (vi) M.G.L.—7. (vii) Unirrigated ; irrigated. (viii) 2 rotary weedings ; Nil. (ix) 37cm. ; 45 cm. (x) 2.2.61 ; 22.1.62.

2. TREATMENTS :

Same as in expt no. 60(52) on page 87.

3. DESIGN :

(i) Fact. in R.B D. (ii) 9. (b) N.A. ; 4·1 m.×29·9 m. (iii) 4. (iv) (a) and (b) 3·1 m.×4·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Attack of leaf roller and stem borer. (iii) Tiller count and grain yield. (iv) (a) 1659 to 1961 (treatments modified in 60). (b) No. (c) Nil. (v) and (vi) Nil. (vii) As the variances are heterogeneous and Treatments × Years interaction is absent, results of individual experiments are presented below.

5. RESULTS :

60(62)

(i) 3205 Kg/ha. (ii) 464·7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

E=3343 Kg/ea.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $I_0$ | 3168 | 3361 | 3232 | 2936 | 3174 |
| $I_1$ | 2834 | 3333 | 3499 | 3138 | 3201 |
| Mean | 3001 | 3347 | 3366 | 3037 | 3188 |

61(26)

(i) 2534 Kg/ha. (ii) 288·3 Kg/ha. (iii) Main effect of S is highly significant. (iv) Av. yield of grain in Kg/ha.

E=2582 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $I_0$ | 2582 | 2451 | 2629 | 2157 | 2455 |
| $I_1$ | 2901 | 2538 | 2721 | 2246 | 2602 |
| Mean | 2742 | 2494 | 2675 | 2202 | 2528 |

C.D. for S marginal means=297·4 Kg/ha.

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 60(169), 61(162), 62(141).**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'C'.**

Object : –To study the effect of different methods of planting on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—G.M. (b) N.A. (c) G.M. @ 28 Kg/ha. (ii) Red sandy loam. (iii) 8.7.60/7.8.60 ; 26.6.61/28.7.61 ; 11.7.62/3.8.62. (iv) (a) 4 ploughings, 2 puddlings and levelling. (b) Transplanting. (c) 28 Kg/ha. (d) As per treatments. (e) 2 to 3. (v) 45 to 55 Q/ha. of G.M.+22·4 Kg/ha. of $P_2O_5$ to G.M. 22·4 Kg/ha. of N at planting+11·2 Kg/ha. of N as top dressing applied as A/S. (vi) S. 1092 for 60(169) and SR. 26 B (medium). (vii) Irrigated. (viii) Japanese weeder at an interval of 3 weeks and 1 or 2 hand weeding. (ix) 33 cm.; 42 cm.; 37 cm. (x) 28.12.60 ; 29.11.61 ; 19.11.62.

2. TREATMENTS :

3 methods of planting of seedlings : $T_1$=In the form of equilateral triangle of side 20 cm:, $T_2$=In the form of square of side 20 cm., and $T_3$=In the form of rectangle of sides 20 cm. × 18 cm.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) For $T_1$ and $T_2$ : 2·1 m. × 8·5 m.; for $T_3$ : 2·4 × 8·5 m. (b) For $T_1$ and $T_2$ : 1·8 m. × 8·1 m.; for $T_3$ : 2·0 × 8·1 m. (v) 1 row on all sides. (vi) Yes.

4. GENERAL ;

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1260 to 1962. (b) N.A. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and treatments × years interaction is absent.

5. RESULTS :

(i) 3811 Kg/ha. (ii) 665·6 Kg/ha. [based on 34 d.f. made up of pooled error and treatments × years interaction). (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|
| Av. yield | 4098 | 3606 | 3728 |

C.D.=383·4 Kg/ha.

| | $T_1$ | $T_2$ | $T_3$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|
| 1960 | 3915 | 3280 | 3296 | * | 3497 | 344·2 |
| 1961 | 5109 | 4331 | 4802 | N.S. | 4747 | 701·3 |
| 1962 | 3270 | 3208 | 3087 | N,S. | 3188 | 600·8 |
| Pooled | 4098 | 3606 | 3728 | * | 3811 | 565·5 |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 60(171), 62(151).**

**Site :- Agri. Res. Stn., Nagenahally.** **Type :- 'C'.**

Object :—To find out the optimum spacing and seedling/hole for Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—G.M. ; Nil. (b) G.M. (c) 22·4 Kg/ha. of $P_2O_5$. (ii) Red sandy loam. (iii) 14.7.60/6.8.60 ; 11.7.62/3.8.62. (iv) (a) 4 ploughings, 1 puddling and levelling. (b) Transplanting. (c) 22 Kg/ha. (d) As per treatments. (v) 11 Q/ha. of F.Y.M. for 60(171) 56 to 67 Q/ha. of G.M.+22·4 Kg/ha. of $P_2O_5$ to G.M. at Sowing+22·4 Kg/ha. of N at sowing+11·2 Kg/ha. of N as top dressing. (vi) SR. 26 B (Medium), (vii) Irrigated. (ix) Passing Jap. Paddy cultivator and 2 hand weedings. (ix) 33 cm., 37 cm. (x) 27.11.60 ; 27.11.62.

2. TREATMENTS :

**Main-Plot treatments :**

5 spacings : $M_1$=15 cm. × 15 cm., $M_2$=15 cm. × 23 cm., $M_3$=15 cm. × 30 cm., $M_4$=23 cm. × 23 cm. and $M_5$=30 cm. × 30 cm.

**Sub-Plot treatments :**

3 seedlings/hole : $S_1$=1, $S_2$=2 and $S_3$=3.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 9·1 m. × 1·0 m. (b) 8·2 m. × 1·0 m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Mild attack of stem borer. (iii) Yield of grain and tiller counts. (iv) (a) 1960 to 1962 (Not conducted in 1961). (b) Yes. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Main-plot as well as sub-plot error variances are homogeneous and main and sub-plot Treatments × years interactions are absent

5. RESULTS :

(i) 2730 Kg/ha. (ii) (a) 868·1 Kg/ha. (b) 506·7 Kg/ha. [based on 70 d.f. made up of pooled error and treatments×years interaction]. (iii) Main effect of M is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | Mean |
|---|---|---|---|---|---|---|
| $S_1$ | 2782 | 2549 | 2845 | 2273 | 3201 | 2730 |
| $S_2$ | 2344 | 2732 | 2326 | 2403 | 3314 | 2624 |
| $S_3$ | 2805 | 2801 | 2843 | 2180 | 3546 | 2835 |
| Mean | 2644 | 2694 | 2672 | 2286 | 3354 | 2730 |

C.D. for M marginal means=517·2 Kg/ha.

| Years | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | Sig. | $S_1$ | $S_2$ | $S_3$ | Sig. | G.M. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 2293 | 2522 | 2621 | 2352 | 2578 | N.S. | 2348 | 2435 | 2637 | N.S. | 2473 |
| 1962 | 2995 | 2866 | 2723 | 2219 | 4129 | ** | 3112 | 2814 | 3033 | N.S. | 2986 |
| Pooled | 2644 | 2694 | 2672 | 2286 | 3354 | ** | 2730 | 2624 | 2835 | N.S. | 2730 |

| S.E./main-plot | S.E./Sub-plot |
|---|---|
| 966·1 | 444·5 |
| 757·6 | 562·1 |
| 868·1 | 506·7 |

**Crop :- Paddy (*Kharif*).** **Ms. 62(13), 63(1), 64(14).**

**Site :- Agri. Res. Stn., Nagenhalli.** **Type :- 'C'.**

Object :— To study the number and proper time, to pass Japanese paddy cultivator, required for Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy after G.M. (b) G.M. (c) 22·4 Kg/ha. of $P_2O_5$ at the time of G.M. sowing. (ii) Sandy loam. (iii) 10.7.62/6.8.62 ; 30.5.63/10.7.63 ; 7.7.64/27.8.64. (iv) (a) 4 to 5 ploughings. (b) Transplanting. (c) —. (d) 23 cm.×23 cm. (e) 2 to 3. (v) 67 Q/ha. of G.M.+22·4 Kg/ha. of $P_2O_5$ as Super+6·7 Kg/ha. of N+11·2 Kg/ha. of N top dressed for 62 (13) ; 67 Q/ha. of G.M.+22·4 Kg/ha. of N as A/S for 63(1) ; G.L. at 56 Q/ha.+33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ for 64(14). (vi) S.R. 26 B (mdium). (vii) Irrigated. (viii) As per treatments. (ix) 44 cm. ; 31 cm. ; 55 cm, (x) 23.11.62 ; 24.11.63 ; 9.12.64.

2. TREATMENTS :

4 no. of cultivations : $T_1$=3, $T_2$=4, $T_3$=5 and $T_4$=6 times.
Cultivation done with Japanese paddy cultivator at an interval of 10 days starting from the date of planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4 for 62 (13) and 63 (1); 5 for 64 (14). (iv) (a) 8·0 m.×3·4 m.; 10·3 m.×3·2 m. ; 9·6 m.×3·7 m. (b) 7·1 m.×2·5 m. ; 9·1 m.×2·7 m. ; 8·7 m.×2·7 m. (v) and (vi) Yes.

### 4. GENERAL :

(i) Satisfactory. (ii) Nil for 62 (13) ; Mild incidence of stem borer for 63(1) and 64(14). Serious attack of 'Helminthosporium' Folidol sprayed for 62(13) and 63(1). Fytolan and folidol sprayed for 64(14). (iii) Yield of grain. (iv) (a) 1962-64. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

### 5. RESULTS :

(i) 3463 Kg/ha. (ii) 534·4 Kg/ha. (based on 36 d.f. made up of pooled error and Treatments × years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Mean yield | 3645 | 3535 | 3197 | 3475 |

| Years | $T_1$ | $T_2$ | $T_3$ | $T_4$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|
| 1962 | 3445 | 3301 | 3091 | 3143 | N.S. | 3244 | 601·5 |
| 1963 | 3594 | 3119 | 2622 | 3142 | N.S. | 3119 | 555·2 |
| 1964 | 3847 | 4055 | 3741 | 4007 | N.S. | 3912 | 513·0 |
| Pooled | 3645 | 3535 | 3197 | 3475 | N.S. | 3463 | 534·4 |

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**Crop :- Paddy.** **Ref :-Ms. 62(12), 63(2), 64(15).**

**Site :- Agri. Res. Stn., Nagerhally.** **Type :- 'C'.**

Object :— To find out the number of intercultivations required to the paddy crop with J.P.C. and to find out the suitable time to pass J.P.C. during the growth period.

### 1. BASAL CONDITIONS :

(i) (a) Paddy after G.M. (b) G.M. (c) 22·4 Kg/ha. of $P_2O_5$ for 62 (12) and 63(2) Nil for 64(15). (ii) Sandy loam. (iii) 15-7-62/10-8-62 ; 30-5-63/10-7-63; 7-7-64/27-8-64. (iv) 4 to 5 ploughings, (b) Transplanting. (c) —. (d) 23 cm. × 23 cm. for 62 (12) and 63 (2) ; 23 cm. × 15 cm for 64 (15). (e) 2 to 3. (v) G.M. at 67 Q/ha. + 22·4 Kg/ha. of $P_2O_5$ as Super + 6·7 Kg/ha. of N top dressed for 62(12). 67 Q/ha. of G.M. + 22·4 Kg/ha. of N as A/S for ; 63(2) ; G.M. at 56 Q/ha. + 33·6 Kg/ha. of N + 22·4 Kg/ha. of $P_2O_5$. (vi) S. 1092. (vii) Irrigated. (viii) As per treatments. (ix) 43 cm. ; 37 cm. ; 55 cm. (x) 16.12.62 ; 16.12.63 ; 4.1.65.

### 2. TREATMENTS :

Same as in expt. no. 62 (13) on page 98.

### 3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4 for 62 (12) and 63 (2) ; 5 for 64(15). (iv) (a) 9·1 m. × 3·4 m. ; 10·3 m. × 3·2 m. ; 7·8 × 4·1 m. (b) 8·2 m. × 2·5 m. ; 9·1 m. × 2·7 m. ; 6·9 m. × 3·2 m. (v) and (vi) Yes.

### 4. GENERAL :

(i) Good. (ii) Nil for 62(12). Mild incidence of stem borer for 63(2). Attack of Helminthosporium and blast for 64 (15). (iii) Yield of grain. (iv) (a) 1962-64. (b) No. (c) Results of combined analysis are presented under 5. Results. Folidol sprayed for 62(12) and 63(2) Fytolan and folidol sprayed for 64(15). (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

### 5. RESULTS :

(i) 2200 Kg/ha. (ii) 372·1 Kg/ha. (based on 36 d.f. made up of pooled error and Treatments × years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Mean yield | 2129 | 2359 | 2158 | 2155 |

| Years | $T_1$ | $T_2$ | $T_3$ | $T_4$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|
| 1962 | 2370 | 2423 | 2576 | 2446 | N.S. | 2454 | 387·3 |
| 1963 | 1058 | 1318 | 1101 | 1100 | N.S. | 1144 | 324·4 |
| 1964 | 2794 | 3140 | 2668 | 2766 | N.S. | 2842 | 431·6 |
| Pooled | 2129 | 2359 | 2158 | 2155 | N.S. | 2200 | 372·1 |

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**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 60 (263), 61(254), 62(255).**

**Site :- Agri. Res. Stn., Sirsi.** **Type :- 'C'.**

Object :— To study the effect of interculture on paddy crop in mid-land.

1. BASAL CONDITIONS :

(i) (a) Paddy after Paddy. (b) Paddy. (c) 12·4 C.L./ha. of F.Y.M.+33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (ii) Sandy loam, laterite soil. (iii) N.A. for 60 and 61 ; 16.7.62. (iv) (a) 4 ploughings and levelling. (b) Line planting. (c) N.A. (d) 23·3 cm.×20·3 cm. (e) 4 to 6. (v) 12·4 C.L./ha. of F.Y.M. by broadcasting+33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super. (vi) W.H.-1690. (vii) Unirrigated. (viii) As per treatments. (ix) N.A. for 60 and 61 ; 26.11.62.

2. TREATMENTS :

$T_0$=Control (No weeding, No interculturing, No stirring), $T_1$=Removing weeds by hands (15, 30, 45 and 60 days after planting) $T_2$=Stirring the soil by kergat hoe (4 times) and $T_3$=Interculturing by Rotory hoe.

3 . DESIGN :

(i) R.B.D. (ii) (a) 4, (b) N.A. (iii) 8 for 60(263) and 61 (254) and 6 for 62 (255). (iv) (a) and (b) N.A. (v) and (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tiller counts and grain yield. (iv) 1960 to 62. (b) Yes. (c) Results of combined analysis given under 5. Results (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent. Results of the individual experiments are presented below.

5. RESULTS :

60(263)

(i) 3025 Kg/ha: (ii) 224·3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av. yield | 3001 | 3115 | 2946 | 3036 |

61(254)

(i) 3924 Kg/ha. (ii) 760·9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av. yield | 3710 | 4326 | 3799 | 3861 |

**62(255)**

(i) 3111 Kg/ha. (ii) 224·8 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av. yield | 3043 | 3349 | 3099 | 2954 |

C.D.=276·6 Kg/ha.

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**Crop :- Paddy.** **Ref :- Ms. 60(262), 61(253), 62(254).**

**Site :- Agri. Res. Stn., Sirsi.** **Type :- 'C'.**

Object : — To find out the effect of interculture on Paddy crop in low land.

1. BASAL CONDITIONS :

(i) (a) Paddy after Paddy. (b) Paddy. (c) 12·4 C.L./ha. of F.Y.M.+33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (ii) Laterite sandy loam. (iii) N.A. for 60 (262) and 61 (253) ; 16.7.62. (iv) (a) 4 ploughings with iron plough and levelling. (b) Line planting. (c) N.A. (d) 20 cm.×20 cm. (e) 4 to 6. (v) 12·4 C.L./ha. of F.Y.M.+33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (vi) W.H. 1690 (170 to 175 days). (vii) Unirrigated. (viii) As per treatments. (ix) 292 cm. ; N.A. ; 294 cm. (x) N.A. ; N.A. ; 28.11.62.

2. TREATMENTS :

4 cultural treatments : $T_0$=Control (No weeding, no interculture ; no stirring), $T_1$=Removing weeds by hand (15, 30, 45 and 60 days after planting), $T_2$=Stirring the soil in Keryat hoe-4 times and $T_3$=Interculturing by rotary hoe.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8 for 60 and 61 ; 6 for 62. (iv) (a) and (b) N.A. (v) and (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960-62. (b) Yes. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent.

5. RESULTS :

**60(262)**

(i) 3438 Kg/ha. (ii) 229·8 Kg/ha. (iii) Treatment differences are not significant. (fv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Mean yield | 3575 | 3468 | 3369 | 3340 |

**61(253)**

(i) 5248 Kg/ha. (ii) 937·1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Mean yield | 5158 | 5201 | 5344 | 5289 |

**63(254)**

(i) 3502 Kg/ha. (ii) 384·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Mean yirld | 3434 | 3462 | 3591 | 3519 |

**Crop :- Paddy.** **Ref :- Ms. 61(63).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'CV'.**

Object :—To study the effect of the time of sowing on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) 33·6 Kg/ha. of N as A/S in split doses and 33·6 Kg/ha. of $P_2O_5$ as single or double Super at the time of planting. (ii) Clay loam. (iii) As per treatments. (iv) (a) 3 to 4 ploughings. (b) Transplanting. (c) 23 to 38 Kg/ha. (d) 23 cm.×23 cm. (e) 3. (v) 33·6 Kg/ha. of N as A/S applied in split doses+35·9 Kg/ha. of $P_2O_5$ as Super at the time of planting. (vi) As per treatments. (vii) Irrigated. (viii) 3 weedings. (ix) N.A. (x) N.A.

2. TREATMENTS :

**Main plot treatments :**

5 dates of sowing : $D_1$=10.6.1961, $D_2$=17.6.1961, $D_3$=5.7.1961, $D_4$=15.7.1961 and $D_5$=7.8.1961.

**Sub-plot treatments :**

5 varieties : $V_1$=S—749, $V_2$=S—661, $V_3$=S—317, $V_4$=S—1092 and $V_5$=SR—26—B.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication, 5 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) and (b) 10·1 m.×1·1 m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 3173 Kg/ha. (ii) (a) 172·3 Kg/ha. (b) 176·9 Kg/ha. (iii) Main effects of D, V and interaction D×V are highly significant (iv) Av. yield of grain in Kg/ha.

| | $D_1$ | $D_2$ | $D_3$ | $D_4$ | $D_5$ | Mean |
|---|---|---|---|---|---|---|
| $V_1$ | 3615 | 3716 | 3590 | 2737 | 1983 | 3128 |
| $V_2$ | 5072 | 4846 | 4017 | 2988 | 1707 | 3726 |
| $V_3$ | 2134 | 1883 | 2008 | 1305 | 1356 | 1737 |
| $V_4$ | 4846 | 3992 | 3917 | 2686 | 1532 | 3395 |
| $V_5$ | 4645 | 4494 | 4670 | 3214 | 2385 | 3882 |
| Mean | 4062 | 3786 | 3640 | 2586 | 1793 | 3173 |

C.D. for D marginal means =103·2 Kg/ha.

C.D. for V marginal means =99·6 Kg/ha.

C.D. for V means at the same level of D =223·0 Kg/ha.

C.D. for D means at the same level of V =224·5 Kg/ha.

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**Crop :- Paddy (*IInd crop*).** **Ref :- Ms. 60(65), 61(39), 62(30).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'CV'.**

Object :—To find out the effect of topping on grain yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Laterite, loamy in texture. (iii) 28.10.60 ; 21.10.61 ; 28.10.62. (iv) (a) 5 to 6 ploughings, puddling and levelling. (b) Transplanting. (c) 18 Kg/ha. (d) 20 cm.×20 cm. ; 25 cm.×23 cm. ; 25 cm.×20 cm. (e) —. (v) G.L. at 56 Q/ha.+33·6 Kg/ha. of N as A/S+33·6 Kg/ha. of $P_2O_5$ as super+33·6 Kg/ha. of $K_2O$ as Mur. Pot. for 60(65) ; G.L. at 29 Q/ha.+34 Kg/ha. of $P_2O_5$ as super+28·4 Kg/ha. of $K_2O$ as Mur. Pot.+45·4 Kg/ha. of N as A/S for 61(39) and G.L. at 56 Q/ha.+34 Kg/ha. of $P_2O_5$ as super+28·4 Kg/ha. of $K_2O$ as Mur. Pot.+45·5 Kg/ha. of N as urea for 62(30). (vi) As per treatment. (vii) Unirrigated for 60(65) and irrigated for 61 and 62. (viii) Nil. (ix) 37 cm., 45 cm., 40 cm. (x) 11.1. 61/28.1.61 ; 11.1.62 ; 10.1.63/28.1.63.

2. TREATMENTS :

**Main-plot treatments :**

2 varieties : $V_1$=G.E.B. 24 and $V_2$=M.G.L. 7.

**Sub-plot treatments :**

3 cultural treatments : $T_1$=No topping at any stage, $T_2$=Topping upto 15 cm. when one month old and $T_3$=Topping whenever rank growth is seen.

3. DESIGN :

(i) Split-Plot. (ii) (a) 2 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 6·1 m. x 3·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Attack of leaf roller ; attack of stem borer ; attack of blast and leaf roller. (iii) Grain yield. (iv) (a) 1960—1962. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Sub-plot error variances are heterogeneous, hence the results of individual years are presented under 5. Results.

5. RESULTS :

**60(65)**

(i) 2279 Kg/ha. (ii) (a) 205·3 Kg/ha. (b) 416·6 Kg/ha. (iii) V effect is significant. (iv) Av. yield of grain in Kg/ha.

| | $T_1$ | | $T_3$ | Mean |
|---|---|---|---|---|
| $V_1$ | 2386 | 2506 | 2302 | 2398 |
| $V_2$ | 1893 | 2416 | 2169 | 2159 |
| Mean | 2140 | 2461 | 2236 | 2279 |

C.D. for V marginal means=266·7 Kg/ha.

**61(39)**

(i) 2271 Kg/ha. (ii) (a) 589·5 Kg/ha. (b) 198·3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $T_1$ | $T_2$ | $T_3$ | Mean |
|---|---|---|---|---|
| $V_1$ | 2258 | 2562 | 2351 | 2390 |
| $V_2$ | 2137 | 2232 | 2087 | 2152 |
| Mean | 2198 | 2397 | 2219 | 2271 |

**62(30)**

(i) 2078 Kg/ha. (ii) (a) 370·3 Kg/ha. (b) 364·9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $T_1$ | $T_2$ | $T_3$ | Mean |
|---|---|---|---|---|
| $V_1$ | 2146 | 2061 | 1800 | 2002 |
| $V_2$ | 2443 | 1966 | 2053 | 2154 |
| Mean | 2294 | 2013 | 1926 | 2078 |

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**Crop :- Paddy (*Ist crop*).** **Ref :- Ms. 60(54), 61(18).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'CV'.**

Object :—To compare the performance of seedlings raised according to Japanese and local method.

## 1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy, G.M. (b) G.M. (c) Nil. (ii) Laterite, loamy in texture. (iii) 16.6.60 ; 19.6.61. (a) 4 to 5 ploughings. (b) Transplanting. (c) N.A. (d) 20 cm. × 20 cm. (e) 3. (v) G,M. at 56 Q/ha.+ 33·6 Kg/ha. of N as A/S+33·6 Kg/ha. of $P_2O_5$ as super+33·6 Kg/ha. of $K_2O$ as Mur. Pot. for 60(54) and G.L. at 49·4 Q/ha.+34 Kg/ha. of $P_2O_5$ as super+11·4 Kg/ha. of N as A/S+28·4 Kg/ha. of $K_2O$ as Mur. Pot. for 61(18). (vi) As per treatments. (vii) Unirrigated. (viii) 1 weeding ; 2 intercultivations. (ix) 181 cm. ; N.A. (x) 27.9.60/3.10.60 /21.10.60 ; 1, 12, 20.10.61.

## 2. TREATMENTS :

**Main-plot treatments :**

3 varieties : $V_1$=M.G.L. 5, $V_2$=P.T.B. 9 and $V_3$=M.G.L. 3.

**Sub-plot treatments :**

2 method of raising seedlings : $M_1$=Japanese and $M_2$=Local.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plot/replication ; 2 sub-plot/main plot. (b) N.A. (iii) 4. (iv) (a) 6·2 m. × 4·0 m. 6·2 m. × 4·4 m. (b) 6·2 m. × 4·0 m. ; 6·1 m. × 4·3 m. (v) Nil. (vi) Yes.

## 4. GENERAL :

(i) Fair ; good. (ii) Mild attack of leaf roller ; moderate attack of kane. (iii) Yield of grain. (iv) (a) 1959 to 1961. (b) No. (c) Nil. (v) and (vi) Nil. (vii) As the sub-plot error, variances are heterogeneous hence individual results are presented below.

## 5. RESULTS :

60(54)

(i) 2639 Kg/ha. (ii) (a) 348·5 Kg/ha. (b) 384·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | $V_3$ | Mean |
|---|---|---|---|---|
| $M_1$ | 2785 | 2416 | 2726 | 2642 |
| $M_2$ | 2740 | 2291 | 2847 | 2626 |
| Mean | 2762 | 2354 | 2786 | 2634 |

**61(18)**

(i) 2483 Kg/ha. (ii) (a) 199·7. (b) 176·2 Kg/ha. (iii) Only the interaction V × M. is significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | $V_3$ | Mean |
|---|---|---|---|---|
| $M_1$ | 2795 | 2394 | 2328 | 2506 |
| $M_2$ | 2465 | 2288 | 2628 | 2460 |
| Mean | 2630 | 2341 | 2478 | 2483 |

C.D. for M means at the same level of V=281·8 Kg/ha.
C.D. for V means at the same level of M=314·4 Kg/ha.

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**Crop :- Paddy** (*IInd crop*). **Ref :- Ms. 63(16), 65(35).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'CV'.**

Object :—Ta compare the performance of seedlings raised according to Japanese method with that of those raised according to local method.

### 1. BASAL CONDITIONS :

(i) (a) Paddy, kolingi, Paddy. (b) Paddy. (c) N.A. (ii) Sandy soil. (iii) 20.10.63, 31.10.65. (iv) (a) 5 to 6 ploughings and puddlings. (b) Transplanting. (c) 18 Kg/ha. ; 37 Kg/ha. (d) 25 cm.×20 cm., 20 cm.×20 cm. (e) 3. (v) G.L at 5683 Kg/ha.+34 Kg/ha. of $P_2O_5$+28·4 Kg/ha. of $K_2O$+11·4 Kg/ha. of N for 63(16). N, P and K each at 33·6 Kg/ha. for 65(35). (vi) As per treatments. (vii) Irrigated. (viii) 1 weeding or intercultivation. (ix) 42 cm., 35 cm. (x) 8, 15, 17.1.64 ; 3, 25.1.66 : 6, 22.2.66.

### 2. TREATMENTS :

**Main-plot treatments :**

5 varieties : $V_1$=MGL—6, $V_2$=MGL—7, $V_3$=CO—14, $V_4$=CO—25 and $V_5$=PTB—20.

**Sub-plot treatments :**

2 methods of raising the seedlings : $M_1$=Local and $M_2$=Japanese method.

### 3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 4, 6. (iv) (a) and (b) 6·1 m.×2·4 m. ; 3·7 m.×2·4 m. (v) Nil. (vi) Yes.

### 4. GENERAL :

(i) Good. (ii) Severe stem borer attack in early stages controlled by spraying with folidol. (iii) Grain and straw yield. (iv) (a) 1963—1965 (treatments changed in 64). (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) As the sub-plot error variances are heterogeneous, individual results are presented below.

### 5. RESULTS :

**63(16)**

(i) 2432 Kg/ha. (ii) (a) 177·9 Kg/ha. (b) 152·4 Kg/ha. (iii) Main effect of V and interaction V×M are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | $V_3$ | $V_4$ | $V_5$ | Mean |
|---|---|---|---|---|---|---|
| $M_1$ | 2420 | 2215 | 2457 | 2482 | 2679 | 2451 |
| $M_2$ | 2715 | 2566 | 2410 | 1759 | 2615 | 2413 |
| Mean | 2567 | 2391 | 2434 | 2121 | 2647 | 2432 |

C.D. for V marginal means =193·9 Kg/ha.
C.D. for M means at the same level of V =105·0 Kg/ha.
C.D. for V means a tthe same level of M =252·7 Kg/ha.

5(35)

(i) 2740 Kg/ha. (ii) (a) 371·3 Kg/ha. (b) 229·3 Kg/ha. (iii) Main effect of V is significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | $V_3$ | $V_4$ | $V_5$ | Mean |
|---|---|---|---|---|---|---|
| $M_1$ | 2626 | 2499 | 2620 | 3302 | 2657 | 2741 |
| $M_2$ | 2758 | 2618 | 2628 | 2988 | 2702 | 2739 |
| Mean | 2692 | 2558 | 2624 | 3145 | 2680 | 2740 |

C.D. for V marginal means=316·2 Kg/ha.

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**Crop :- Paddy** (*IInd crop*). **Ref :- Ms. 64(9).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'V'.**

Object :— To compare the performance of seedlings raised according to Japanese method with that of those raised according to local method.

1. BASAL CONDITIONS :

(i) (a) Paddy, Kolingi, Paddy. (b) Paddy. (c) G.L. at 5683 Kg/ha.+34 Kg/ha. of $P_2O_5$ as Super+28·4 Kg/ha. of $K_2O$ as Pot. Sul.+11·4 Kg/ha. of N as Urea+22·7 Kg/ha. of N as A/S. (ii) Lateriate, loamy in texture. (iii) $M_1$=10.10.64 and 26.9.64. (iv) (a) 5 to 6 ploughings, puddling and levelling. (b) to (e) As per treatments according to Japanese and local method as the case may be (Details N.A.) (v) G.L. at 56·8 Q/ha.+34 Kg/ha. of $P_2O_5$ as Super+28·4 Kg/ha. of $K_2O$ as Mur. Pot.+20·5 Kg/ha. of N as urea. (vi) as per treatments. (vii) Irrigated. (viii) 1 weeding with ratory weeder. (ix) 28 cm. (x) 7-2-65 ; 4-3-65.

2. TREATMENTS :

**Main-plot treatments :**

4 varieties : $V_1$=M.G.L.—6, $V_2$=M.G.L.—7, $V_3$=P.T.B.—20 and $V_4$=CO—14.

**Sub-plot treatments :**

2 methods of raising the seedlings : $M_1$=Japanese and $M_2$=Local method.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 3·7 m.×3·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No serious pests and diseases. (iii) Tiller counts, height measurements grain and straw weight. (iv) (a) 1963-64 (modified in 64). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 3029 Kg/ha. (ii) (a) 573·0 Kg/ha. (b) 270·6 Kg/ha. (iii) Main effect of M is significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | $V_3$ | $V_4$ | Mean |
|---|---|---|---|---|---|
| $M_1$ | 3397 | 3057 | 3238 | 2848 | 3105 |
| $M_2$ | 3159 | 2818 | 2981 | 2731 | 2922 |
| Mean | 3278 | 2938 | 3110 | 2790 | 3029 |

C.D. for V marginal means=498·4 Kg/ha.

**Crop :- Paddy** (*IInd Crop*). **Ref :- Ms. 60(67), 61(38).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'CV'.**

Object :— To compare the performance of seedlings raised from heavy seeds with those from light seeds.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Laterite, loamy in texture. (iii) 3-11-60 ; 21-10-61. (iv) (a) 5-6 ploughings. (b) Transplanting. (c) 18 Kg/ha. (d) 20 cm.×20 cm. in 60 (97) ; 25 cm.×23 cm. in 61 (28). (e) 3. (v) F.Y.M. at 112·0 Q/ha. +N, P and K each at 33·6 Kg/ha. for 60 (67), G.L. at 29·6 Q/ha.+34 Kg/ha. of $P_2O_5$+28·4 Kg/ha. of $K_2O$+11·4 Kg/ha. of N for 61 (38). (vi) As per treatments. (vii) Unirrigated. (viii) 1 weeding. (ix) 31 cm., 44 cm. (x) 28-1-61, 11. 17-1-62.

2. TREATMENTS :

**Main-plot treatments :**

2 varieties : $V_1$=M.G.L.—7 and $V_2$=P.T.B.—20.

**Sub-plot treatments :**

2 types of seedlings : $T_1$=Seedlings raised from heavy seeds and $T_2$=Seedlings raised from light seeds.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 Main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 4·3 m.×1·2 m. for 60 (67), 3·0 m.×1·8 m. for 61(38). (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Severe attack of leaf roller controlled by dusting with gammaxine in 60 (67). Moderate attack of stem borer and leaf spot. Sprayed with 'Paramor' and 'Fytolan' in 61(38). (iii) Yield of grain. (iv) (a) 1960-61. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Main-plot error variances are homogeneous and Treatments×years interaction absent. Sub-plot error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 2813 Kg/ha. (ii) (a) 353·9 Kg/ha. (based on 11 d.f. made up of pooled error and Treatments×years interaction). (b) 637·2 Kg/ha. (based on 2 d.f. made up of Treatments×years interaction). (iii) Main effect of V is significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | Mean |
|---|---|---|---|
| $T_1$ | 2682 | 2930 | 2806 |
| $T_2$ | 2700 | 2939 | 2820 |
| Mean | 2691 | 2934 | 2813 |

C.D. for V marginal means=224·9 Kg/ha.

| Years | $V_1$ | $V_2$ | Sig. | $T_1$ | $T_2$ | Sig. | G.M. | S.E./Main-plot | S.E./Sub-plot |
|---|---|---|---|---|---|---|---|---|---|
| 1960 | 2228 | 2368 | N.S. | 2398 | 2198 | N.S. | 2298 | 374·6 | 332·9 |
| 1961 | 3154 | 3501 | N.S. | 3214 | 3441 | N.S. | 3327 | 330·8 | 260·0 |
| Pooled | 2691 | 2934 | * | 2806 | 2820 | N.S- | 2813 | 353·9 | 637·2 |

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**Crop :- Paddy** (*Ist Crop*). **Ref :- Ms. 61(31).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'CV'.**

Object :— To compare the performance of seedlings raised from light and heavy seeds on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy, Paddy, G.M. (b) G.M. (c) Nil. (ii) Laterite, Loamy in texture. (iii) 10.6.61. (iv) (a) 5 ploughings. (b) Transplanting. (c) 18 Kg/ha. (d) 25 cm. × 23 cm. (e) —. (v) G.L. at 1344 Kg/ha. + 37·9 Kg/ha. of $P_2O_5$ as Super + 28·4 Kg/ha. of $K_2O$ as Mur. Pot. + 11·4 Kg/ha. of N as Urea + 22·7 Kg/ha. of N as A/S top dressed. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 547 cm. (x) 5.10.61.

2. TREATMENTS :

**Main-plot treatments :**

2 varieties : $V_1$=PTB—9 (Late.) and $V_2$=MGL—5 (medium).

**Sub-plot treatments :**

2 types of seeds $T_1$=Heavy seed and $T_2$=Light seeds.

3. DESIGN :

(i) Split plot. (ii) (a) 2 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 3·1 m. × 1·8 m. (v) Nil. (vii) Yes.

4. GENERAL :

(i) Good. (ii) Mild attack of 'gallfly' notied. Sprayed with Paramar' to check the spread. (iii) Grain yield. (iv) (a) 1959-61. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Expt. not conducted in 1960.

5. RESULTS :

(i) 2770 Kg/ha. (ii) (a) 616·2 Kg/ha. (b) 179·4 Kg/ha. (iii) None of the effect is Significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | Mean |
|---|---|---|---|
| $T_1$ | 2846 | 2676 | 2761 |
| $T_2$ | 2858 | 2700 | 2779 |
| Mean | 2852 | 2686 | 2770 |

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**Crop :- Paddy (*1st Crop*).** **Ref :- Ms. 60(56), 61(32).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'CV'.**

Object :— To compare the performance of aged seedlings vs. young seedlings.

1. BASAL CONDITIONS :

(i) (a) Paddy-G.M. (b) *Sesbania* (G.M.). (c) Nil. (ii) Laterite. loamy in texture. (iii) 12.7.60 ; 18.6.61. (iv) (a) 4 to 6 ploughings. (b) Transplanting. (c) 18 Kg/ha. (d) 20 cm. × 20 cm. for 60(56), 25 cm. × 23 cm. for 61 (32). (e) 4. (v) G.M. at 56 Q/ha. + 33·6 Kg/ha. of N as A/S + 33·6 Kg/ha. of $P_2O_5$ as super + 33·6 Kg/ha. of $K_2O$ as Mur. Pot. (vi) As per treatments. (vii) Unirrigated. (viii) 1 hand weeding. (ix) 181 cm., N.A. (x) 22.10.60 ; 2.10.61.

2. TREATMENTS :

**Main-plot treatments :**

2 varieties : $V_1$=MGL—1 and $V_2$=MGL—5.

**Sub-plot treatments :**

2 types of seedlings : $T_1$=Aged and $T_2$=Young seedlings.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 4·8 m. × 1·1 m. for 60 (56) ; 3·1 m. × 1·8 m. for 61 (32). (vi) Nil. (vi) Yes.

### 4. GENERAL :

(i) Good. (ii) Attack of leaf roller controlled by spraying folidol in 60 (56). Attack of Gallfly spraying with 'Paramar' in 61 (32). (iii) Yield of grain. (iv) (a) 1959-1961 (59 N.A.) (b) No. (c) Results of combined analysis are presented under 5. Results. (v) N.A. (vi) Nil. (vii) Main-plot as well as sub-plot error variance are homogeneous and Treatments×years interaction are absent.

### 5. RESULTS :

(i) 2216 Kg/ha. (ii) (a) 411·9 Kg/ha. (based on 11 d.f. made up of pooled error and Treatments×years interaction). (b) 367·5 Kg/ha. (based on 22 d.f. made up of pooled error and Treatments×years interaction). (iii) Main effects of V and T are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | Mean |
|---|---|---|---|
| $T_1$ | 2205 | 1661 | 1933 |
| $T_2$ | 2611 | 2388 | 2500 |
| Mean | 2408 | 2024 | 2216 |

C.D. for V marginal means=261·7 Kg/ha.
C.D. for T marginal means=220·0 Kg/ha.

| Years | $V_1$ | $V_2$ | Sig. | S·E./mains plot | $T_1$ | $T_2$ | Sig. | G.M. | S.E./sub-plot |
|---|---|---|---|---|---|---|---|---|---|
| 1960 | 2269 | 1840 | ** | 256·7 | 1689 | 2420 | ** | 2054 | 270·1 |
| 1961 | 2548 | 2210 | N.S. | 550·4 | 2177 | 2580 | * | 2379 | 389·3 |
| Pooled | 2408 | 2025 | ** | 411·9 | 1933 | 2500 | ** | 2216 | 367·5 |

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**Crop :- Paddy** *(IInd crop).* **Ref :- Ms. 60(61), 61(37).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'CV'.**

Object :—To compare the performance of aged seedlings with young seedlings.

### 1. BASAL CONDITIONS :

(i) (a) Paddy, G.M., Paddy. (b) Paddy. (c) G.M. at 56 Q/ha.+34 Kg/ha. of $P_2O_5$+33·6 Kg/ha. of N +28 Kg/ha. of $K_2O$ for 60(61) G.L. at 29·6 Q/ha.+11·4 Kg/ha. of N+34 Kg/ha. of $P_2O_5$+28·4 Kg/ha. of $K_2O$ for 61(37). (ii) Laterite, loamy in texture. (iii) 3.11.60 ; N.A. (iv) (a) 5 to 6 ploughings. (b) Transplanting. (c) 18 Kg/ha. (d) 20 cm.×20 cm. ; 25 cm.×23 cm. (e) 3. (v) G.L. at 56 Q/ha.+ N, P and K each at 33·6 Kg/ha. for 60(61). G.L. at 29·6 Q/ha.+34 Kg/ha. of $P_2O_5$+11·4 Kg/ha. of N as A/S for 61(37). (vi) As per treatments. (vii) Unirrigated. (viii) 1 weeding. (ix) 37 cm., 45 cm. (x) 21.1.61 ; 11.1.62.

### 2. TREATMENTS :

**Main-plot treatments :**
2 varieties : $V_1$=MGL–6 and $V_2$=GEB–24.

**Sub-plot treatments :**
2 types of seedlings : $T_1$=Aged and $T_2$=Young seedlings.

### 3. DESIGN :

(i) Split-plot. (ii) (a) 2 main plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 4·3 m.×1·8 m. ; 3·1 m.×1·8 m. (v) Nil. (vi) Yes.

## 4. GENERAL :

(i) Fair. $T_1$ lodged in 61(37) a fortnight before harvest. (ii) Heavy attack of leaf roller at later stage. Controlled by dusting gammaxene in 60(61) Attack of stem borer sprayed with endrex in 61(37). (iii) Yield of grain. (iv) (a) 1959 (Ist crop)—1961. (b) No. (c) Results of combined analysis given under 5. Results. (v) N.A. (vi) Nil. (vii) In 1959 varieties were different. Main-plot error variances are heterogeneous and treatments × years interaction is present. Sub-plot error variances are homogeneous, and treatments × years interaction is absent.

## 5. RESULTS :

(i) 2281 Kg/ha. (ii) (a) 3013·7 Kg/ha. (based on 1 d.f. made up Treatments × years interaction). (b) 304·0 Kg/ha. (based on 22 d.f. made up of pooled error and Treatments × years interaction). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | Mean |
|---|---|---|---|
| $T_1$ | 2256 | 2213 | 2234 |
| $T_2$ | 2212 | 2444 | 2328 |
| Mean | 2234 | 2328 | 2281 |

| Years | $V_1$ | $V_2$ | Sig. | $T_1$ | $T_2$ | Sig. | G.M. | S.E./main-plot | S.E./sub-plot |
|---|---|---|---|---|---|---|---|---|---|
| 1960 | 1444 | 2408 | ** | 2204 | 1648 | ** | 1926 | 421·0 | 274·8 |
| 1961 | 3024 | 2248 | ** | 2265 | 3008 | ** | 2636 | 139·0 | 330·8 |
| Pooled | 2234 | 2328 | N.S. | 2234 | 2328 | N.S. | 2281 | 3013·7 | 304·0 |

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**Crop :- Paddy (*Ist crop*).** **Ref :- Ms. 60(46), 62(23), 63(12).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'CV'.**

Object :—To compare the method of early drilling with late transplanting during the first crop season in double crop land.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Kolingi (G.M.) ; Paddy ; Sesbania (G.M.). (c) Nil. (ii) Laterite, loamy in texture. (iii) 15, 16.7.60 ; 9.7.62 ; 11.7.63. (iv) (a) 5 to 6 ploughings. (b) As per treatments. (c) 67 Kg/ha., 18 Kg/ha., N.A. (d) 20 cm. × 20 cm. ; 25 cm. × 23 cm. (e) —. (v) 56 Q/ha. of F.Y.M.+56 Q/ha. of G.M.+22·4 Kg/ha. of N as A/S+33·6 Kg/ha. of $P_2O_5$ as super+33·6 Kg/ha. of $K_2O$ as Mur. Pot. for 60(46) ; F.Y.M. at 61·7 Q/ha.+34 Kg/ha. of $P_2O_5$ as super+28·4 Kg/ha. of $K_2O$ as Mur. Pot.+11·0 Kg/ha. of N as A/S for 62(23) and 61·7 Q/ha. of F.Y.M.+34 Kg/ha of $P_2O_5$ as super+28·4 Kg/ha. of $K_2O$ as Mur. Pot. for 63(12). (vi) As per treatments. (vii) Unirrigated. (viii) 1 weeding and 1 intercultivation. (ix) 181 cm. ; 356 cm. ; 364 cm. (x) 9.9.60 and 11.10.60 ; 28.9.62 and 5.10.62 ; 12, 17 and 30.9.63.

## 2. TREATMENTS :

**Main-plot treatments :**

3 varieties : $V_1$=MGL—5, $V_2$=PTB—9 and $V_3$=PTB—20.

**Sub-plot treatments :**

2 methods of sowing : $M_1$=Drilling and $M_2$=Transplanting.

Drilling on 20.5.60 ; 26.4.62 and 10.5.63 respectively.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication, ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 6·1 m.×7·6 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960 (1st crop) to 1963 (expt. not conducted in 61). (b) No. (c) Nil. (v) Nil. (vi) Severe damage by birds in PTB—28 plots for 63(12). (vii) Sub-plot error variances are heterogenous. Individual results are given below.

5. RESULTS :

**60(46)**

(i) 1793 Kg/ha. (ii) (a) 295·0 Kg/ha. (b) 261·5 Kg/ha. (iii) Main effects of V and M are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | $V_3$ | Mea |
|---|---|---|---|---|
| $M_1$ | 2497 | 2349 | 1536 | 2127 |
| $M_2$ | 1507 | 1995 | 874 | 1459 |
| Mean | 2002 | 2172 | 1205 | 1793 |

C.D. for V marginal means =360·9 Kg/ha.
C.D. for M marginal means =241·6 Kg/ha.

**62(23)**

(i) 1247 Kg/ha. (ii) (a) 250·6 Kg/ha. (b) 108·6 Kg/ha. (iii) Main effects of V and M are highly significant. (iv) Av. yield of grain an Kg/ha.

| | $V_1$ | $V_2$ | $V_3$ | Mean |
|---|---|---|---|---|
| $M_1$ | 1516 | 782 | 1799 | 1366 |
| $M_2$ | 1398 | 385 | 1601 | 1128 |
| Mean | 1457 | 584 | 1700 | 1247 |

C.D. for V marginal means=306·6 Kg/ha.
C.D. for M marginal means=100·2 Kg/ha.

**63(12)**

(i) 1471 Kg/ha. (ii) (a) 110·4 Kg/ha. (b) 265·4 Kg/ha. (iii) Main effects of V and M are highly Interaction V×M is significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | $V_3$ | Mean |
|---|---|---|---|---|
| $M_1$ | 2085 | 207 | 1068 | 1120 |
| $M_2$ | 2342 | 1197 | 1926 | 1822 |
| Mean | 2214 | 702 | 1497 | 1471 |

C.D. for V marginal means =135.1 Kg/ha.
C.D. for M marginal means =245·0 Kg/ha.
C.D. for M means at the same level of V=424·6 Kg/ha.
C.D. for V means at the same level of M=332·9 Kg/ha.

———

**Crop :- Paddy** (*Ist crop*). **Ref :- Ms. 60(55), 61(30), 62(21).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'CV'.**

Object :—To study the effect of topping paddy plants on grain yield.

## 1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy, G.M. (b) Kolingi (G.M). (c) Nil. (ii) Laterite, loamy in texture. (iii) 26.6.60, 17.6.61, 16.6.62. (iv) (a) 5 to 6 ploughings. (b) Transplanting, (c) 18 Kg/ha. (d) 20 cm.×20 cm. in 60(55), 25 cm.×23 cm. for others. (e) 4. (v) G.M. at 56 Q/ha.+67·2 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$ +33·6 Kg/ha. of $K_2O$ for 60(55), G.L at 59·3 Q/ha.+34 Kg/ha. of $P_2O_5$+28·4 Kg/ha. of Mur. Pot.+45·4 Kg/ha. of N for others. (vi) As per treatments. (vii) Unirrigated. (viii) 1 weeding. (ix) 181 cm., 547 cm., 256 cm. (x) 6.10.60 ; 2, 13.10.61 ; 4, 5.10.62.

## 2. TREATMENTS :

**Main-plot treatments :**

2 varieties : $V_1$=MGL—5 and $V_2$=PTB–9.

**Sub-plot treatments :**

3 cultural treatments : $T_1$=Not topped at any stage, $T_2$=Topped at a height of 15 cm. one month after planting and $T_3$=Topped only when rank growth is observed.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 6·2 m.×4·4 m. (v) Nil. (vi) Yes.

## 4. GENERAL :

(i) Good. Lodging occured in 62(21). (ii) Leaf roller became severe at vegetative stage controlled by spraying with folidol in 60(55). Attack of 'kane' in 61(30). (iii) Yield of grain. (iv) (a) 1960–1962. (b) No. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Main-plot as well as sub-plot error variances are homogeneous and Treatments×years interactions are present.

## 5. RESULTS :

(i) 2551 Kg/ha. (ii) (a) 800·9 Kg/ha. (based on 2 d.f. made up of Treatments×years interaction). (b) 648·0 Kg/ha. (based on 8 d.f. made up of Treatments×years interaction). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $T_1$ | $T_2$ | $T_3$ | Mean |
|---|---|---|---|---|
| $V_1$ | 2846 | 2709 | 2364 | 2640 |
| $V_2$ | 2628 | 2465 | 2292 | 2462 |
| Mean | 2737 | 2587 | 2328 | 2551 |

| Years | $V_1$ | $V_2$ | Sig. | S.E./main-plot | $T_1$ | $T_2$ | $T_3$ | Sig. | G.M. | S.E./Sub-plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 2501 | 2624 | N.S. | 388·0 | 2490 | 2650 | 2546 | N.S. | 2562 | 204·6 |
| 1961 | 2463 | 1937 | * | 465·0 | 2470 | 2142 | 1988 | * | 2200 | 327·7 |
| 1962 | 2956 | 2825 | N.S. | 127·0 | 3252 | 2968 | 2451 | * | 2891 | 172·5 |
| Pooled | 2640 | 2462 | N.S. | 800·9 | 2737 | 2587 | 2328 | N.S. | 2551 | 648·0 |

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. for 60(168) and 61(160) and 22·4 Kg/ha. of $P_2O_5$ for 62(15). (ii) Red loam. (iii) 14.7.60/7.8.60 ; 18.7.61/17.8.61 ; 11.7.62/7.8.62. (iv) (a) 5 ploughings. (b) Transplanting. (c) N,A. (d) and (e) As per treatments. (v) Nil. (vi) SR. 26 B. (medium). (vii) Irrigated. (viii) Passing Jap. paddy cultivator 15 days after planting+hand weeding 30 days after planting. (ix) 33 cm. ; 51 cm.; 37 cm. (x) 29.11.60 ; 18.12.61 ; 19.11.62.

2. TREATMENTS :

4 methods of cultivation : $T_1$=Jhackersey : 67·2 Q/ha. G.M.+33·6 Kg/ha. of N in 3 doses with a spacing of 23 cm.×23 cm. and 1 seedling/hole, $T_2$=Japanese : 67·2 Q/ha. G.M.+112 Kg/ha of A/S and 112 Kg/ha. Super at planting and 112 Kg/ha. of A/S one month after planting with a spacing of 23 cm.×23 cm. and 3 seedlings/hole. $T_3$=Chinese : 500 Q/ha. Compost+112 Kg/ha. N in 4 doses+44·8 Kg/ha. of N+44·8 Kg/ha. of $P_2Q_5$ in one dose at planting with a spacing of 15 cm.×15 cm. with 2 seedlings/hole and $T_4$=Local improved : 67·2 Q/ha. of G.M.+33·6 Kg/ha. of N in 3 doses+22·4 Kg/ha. $P_2O_5$ in one dose at planting with a spacing of 20 cm.× 20 cm. and 3·4 seedlings/hole.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) Varies from treatment to treatment. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1960 to 1962. (b) No. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments ×years interaction is present.

5. RESULTS :

(i) 3494 Kg/3a. (ii) 954·4 Kg/ha. (based on 6 d.f. made up of treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment : | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield : | 3375 | 3685 | 3473 | 3442 |

| Years | $T_1$ | $T_2$ | $T_3$ | $T_4$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|
| 1960 | 3730 | 4078 | 3655 | 3301 | N.S. | 3691 | 770·0 |
| 1961 | 4167 | 4603 | 4447 | 3919 | N.S. | 4284 | 435·8 |
| 1962 | 2227 | 2374 | 2316 | 3107 | ** | 2506 | 416·0 |
| Pooled | 3375 | 3685 | 3473 | 3442 | N.S. | 3494 | 954·4 |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 63(4), 64(13).**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'CM'.**

Object :—To study the optimum dose of manure and spacing required for short duration variety of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) G.M. (c) 22·4 Kg/ha. of $P_2O_5$ as Super ; Nil. (ii) Red sandy loam. (iii) 15.7.63 ; 29.7.64/5.9.64. (iv) (a) 3 to 5 ploughings. (b) Transplanting. (c) —. (d) As per treatments. (e) 1. (v) 56·0 Q/ha. of G.M. (vi) $CH_2$ (early). (vii) Irrigated. (viii) Passing of J.P.C. (ix) 31 cm. ; 53 cm. (x) 5.12.63 ; 4.12.64.

2. TREATMENTS :

Same as in exp.. no. 63(3) given below.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 9 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 7·3 m.×3·7 m. (b) 3·7 m.×2·4 m. (v) and (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Incidence of stem borer in 63(4). Folidol sprayed. Blitex and folidol sprayed as a precautionery measure in 64(13). (iii) Yield of grain. (iv (a) 1963 to 1964. (b) No. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Main as well as sub-plot error variances are homogeneous and interaction of treatments with years is absent in both.

5. RESULTS :

(i) 2270 Kg/ha. (ii) (a) 1362·5 Kg/ha. [based on 5 d,f. made up of pooled error and interaction of S× years]. (b) 521·2 Kg/ha. [based on 76 d.f. made up of pooled error and interactions of N, P, N×P, N×S, P×S with years]. (iii) Interaction P×S alone is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $P_1$ | $P_2$ | $P_3$ | $S_1$ | $S_2$ | Mean |
|---|---|---|---|---|---|---|
| $N_1$ | 2629 | 2312 | 2102 | 2556 | 2140 | 2348 |
| $N_2$ | 2345 | 2363 | 1943 | 2337 | 2097 | 2217 |
| $N_3$ | 2182 | 2175 | 2378 | 2416 | 2073 | 2245 |
| Mean | 2385 | 2283 | 2141 | 2436 | 2103 | 2270 |
| $S_1$ | 2779 | 2374 | 2156 | | | |
| $S_2$ | 1991 | 2193 | 2126 | | | |

C.D. for P means at the same level of S=346·5 Kg/ha.
C.D. for S means at the same level of P=722·8 Kg/ha.

| Years | $S_1$ | $S_2$ | Sig. | G.M. | S.E./Main/plot |
|---|---|---|---|---|---|
| 1963 | 2505 | 1981 | N.S. | 2243 | 1943·6 |
| 1964 | 2368 | 2226 | N.S. | 2297 | 609·1 |
| Pooled | 2436 | 2103 | N.S. | 2270 | 1362·5 |

| Years | $N_1$ | $N_2$ | $N_3$ | Sig. | $P_1$ | $P_2$ | $P_3$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1963 | 2300 | 2235 | 2194 | N.S. | 2287 | 2326 | 2116 | N.S. | 2243 | 644·6 |
| 1964 | 2396 | 2199 | 2296 | N.S. | 2484 | 2241 | 2166 | N.S. | 2297 | 448·1 |
| Pooled | 2348 | 2217 | 2245 | N.S. | 2385 | 2283 | 2141 | N.S. | 2270 | 521·2 |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 63(3), 64(12).**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'CM'.**

Object :—To study the optimum dose of manure and spacing required for medium duration variety of Paddy.

**Crop :- Paddy** (*Ist crop*). **Ref :- Ms. 60(47), 62(22), 63(11).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'CV'.**

Object :—To study the effect of early drilling vs. late transplanting in single crop land.

1. BASAL CONDITIONS :

(i) (a) Paddy - G.M. (b) G.M. (c) Nil. (ii) Laterite, loamy in texture. (iii) 15, 16.7.60 ; 17.7.62 ; 11.7.63. (iv) (a) 5 to 6 ploughings. (b) As per treatments. (c) 67 Kg/ha. for 60(47), 18 Kg/ha. for 62(22). (d) 20 cm.×25 cm. for 60(47); 25 cm.×23 cm. for 62(22). (e) 3. (v) 56 Q/ha. of F.Y.M.+56 Q/ha. of G.M.+22·4 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+33·6 Kg/ha. of $K_2O$ in 60(47) ; F.Y.M. at 61 Q/ha.+34 Kg/ha. of $P_2O_5$+28·4 Kg/ha. of $K_2O$+11·4 Kg/ha. of N for 62(22) and 63(11). (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 181 cm.; 356 cm.; 264 cm. (x) 11.8.60; 22.8.60 ; 12, 20.10.62 ; 6, 24, 30.9.63.

2. TREATMENTS :

**Main-plot treatments :**

3 varieties : $V_1$=MGL—5, $V_2$=PTB—9 and $V_3$=PTB—28

**Sub-plot treatments :**

2 methods of sowing : $M_1$=Drilling and $M_2$=Transplanting.

Drilling on 20.5.60, 7.6.62 and 4.5.63 respectively.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 7·6 m.×6·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960—1963 (Not conducted in 1961). (b) No. (c) Results of combined analysis given under 5. Results. (v) N.A. (vi) Nil. (vii) Main-plot as well as sub-plot error variances are homogeneous and Treatments×years interactions are present.

5. RESULTS :

(i) 1564 Kg/ha. (ii) (a) 1501·4 Kg/ha. (based on 4 d.f. made up of Treatments×years interaction). (b) 718·0 Kg/ha. (based on 6 d.f. made up of Treatments×years interaction). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | $V_3$ | Mean |
|---|---|---|---|---|
| $M_1$ | 1654 | 810 | 1718 | 1394 |
| $M_2$ | 1891 | 1258 | 2057 | 1735 |
| Mean | 1772 | 1034 | 1888 | 1564 |

| Years | $V_1$ | $V_2$ | $V_3$ | Sig. | S.E./main-Plot | $M_1$ | $M_2$ | Sig. | S.E./Sub-plot |
|---|---|---|---|---|---|---|---|---|---|
| 1960 | 1038 | 1153 | 1392 | N.S. | 325·4 | 926 | 1464 | ** | 180·5 |
| 1962 | 1344 | 916 | 1742 | ** | 215·4 | 1233 | 1434 | ** | 140·6 |
| 1963 | 2936 | 1033 | 2530 | ** | 110·4 | 2024 | 2309 | ** | 171·6 |
| Pooled | 1772 | 1034 | 1888 | N.S. | 1501·4 | 1394 | 1735 | N.S. | 718·0 |

**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 64(31).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'CM'.**

Object :— To study the effect of $N_2$ and plant spacing on the yield of Taichung—65 variety of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) 12·4 C.L./ha. of F.Y.M.+33·6 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$. (ii) Red sandy soil. (iii) 20 and 30.7.64. (iv) (a) 3 ploughings. (b) Transplanting. (c) and (d) As per treatments. (e) 3. (v) 125·6 Q/ha. of Compost+37·7 Q/ha. of G.L. applied with soil prior to transplanting. (vi) T. 65. (vii) Irrigated. (viii) 2 weedings. (ix) 89 cm. (x) 2nd fortnight of Dec. 64.

2. TREATMENTS :

**Main-plot treatments :**

4 manurial treatments : $M_0$=0, $M_1$=67·2 Kg/ha. of N as A/S+33·6 Kg/ha. of $P_2O_5$ as Super+33·6 Kg/ha. of $K_2O$ as Mur. Pot., $M_2$=2 $M_1$ and $M_3$=3 $M_1$.

**Sub-Plot treatments :**

4 spacings : $S_1$=23 cm.×23 cm., $S_2$=15 cm.×23 cm., $S_3$=15 cm.×15 cm. and $S_4$=10 cm.×15 cm.

Half dose of N and full dose of $P_2O_5$ and $K_2O$ were applied on 27.7.1964 and half dose of N applied on 7.9.1964.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication, 4 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 10·0 m. ×10·0 m. (b) 9·1 m.×9·1 m. (v) 46 cm.×46 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Pests were controlled by spraying folidol twice and one spray of Brodeaux mixture. (iii) Grain yield. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 915 Kg/ha. (ii) (a) 276·2 Kg/ha. (b) 110·6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $M_0$ | $M_1$ | $M_2$ | $M_3$ | Mean |
|---|---|---|---|---|---|
| $S_1$ | 1009 | 793 | 776 | 1179 | 939 |
| $S_2$ | 986 | 698 | 743 | 1076 | 876 |
| $S_3$ | 1007 | 933 | 919 | 1109 | 992 |
| $S_4$ | 937 | 742 | 742 | 989 | 852 |
| Mean | 985 | 792 | 795 | 1088 | 915 |

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**Crop :- Paddy.** **Ref :- Ms. 60(25), 61(60), 62(47), 63(33).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'CM'.**

Object :— To find out the advantages of line sowing over broadcasting with and without green manuring.

1. BASAL CONDITIONS:

(i) (a) Paddy after Paddy for 61 (60) and 63 (33); Nil. (b) Paddy. (c) Different nitrogeneous fertilizers @ 33·6 Kg/ha. for 60 (25); Nil ; Nil ; 12·4 C.L./ha. of F.Y.M.+22·4 Q/ha. of G.M.+35·9 Kg/ha. of $P_2O_5$ as Super+33·6 Kg/ha. of N as A/S for 63(33). (ii) Clay loam for 60, 61 and 62 ; N.A. (iii) 27.6.60 ; 27.6.61 ; 7.6.62 ; 12.6.63. (iv) (a) 2 to 3 ploughings. (b) As per treatments. (c) N.A. (d) 15 cm. between rows. (e) –. (v) 24·7 C.L./ha. of F.Y.M.+16·8 Kg/ha. of N as A/S+35·9 Kg/ha. of $P_2O_5$ as Super for 60 (25) ; 12·4 C.L./ha. of Compost+16·8 Kg/ha. of N as A/S+35·9 Kg/ha. of $P_2O_5$ as Super for 61(60) ; 19·8 C.L./ha. of Compost+16·8 Kg/ha. of N as A/S+35·9 Kg/ha. of $P_2O_5$ as super for 62 (47) and 19·8 C.L./ha. of Compost+15·7 Kg/ha. of N as A/S+31·4 Kg/ha. of $P_2O_5$ as Super for 63. (vi) H -320 (late). (vii) Irrigated. (viii) Passing cultivator and weeding for 60 (25); weeding. (ix) 52 cm. ; N.A. ; 67 cm. ; N.A. (x) 3.1.61 ; 29.12.61 ; 3.1.63 ; 6.1.64.

## 2. TREATMENTS :

3 cultural manurial treatments : $T_1$=line sowing by seed drill with 23 cm. between lines, $T_2$=Broadcasting and $T_3$=Line sowing and sowing sannhemp in between the line by the same seed drill.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 30·2 m.×10·0 m. ; 38·4 m.×15·9 m. ; 28·9 m.×6·9 m. ; 43·9 m.×13·7 m. (iii) 5 for 60, 61 and 62, and 6 for 63 (33). (iv) (a) 10·0 m.×10·0 m. ; 12·8 m.×15·9 m. ; 9·6 m.×6·9 m. ; 14·6 m.×13·7 m. (b) 9·5 m.×10·0 m. ; 12·2 m.×15·2 m. ; 9·1 m.×6·4 m.; 14·0 m. ×13·1 m. (v) 9 rows left alround. (vi) Yes.

## 4. GENERAL :

(i) Fair. (ii) Nil. (iii) Tiller counts and grain yield. (iv) (a) 1960 to 1963. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

## 5. RESULTS :

(i) 2639 Kg/ha. (ii) 529·1 Kg/ha. (based on 40 d.f. made up of pooled error and Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|
| Av. yield | 2571 | 2622 | 2723 |

| Years | $T_1$ | $T_2$ | $T_3$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|
| 1960 | 1556 | 2126 | 2147 | N.S. | 1943 | 384·1 |
| 1961 | 2593 | 2392 | 2395 | N.S. | 2460 | 418·8 |
| 1962 | 3249 | 3220 | 3229 | N.S. | 3233 | 800·2 |
| 1963 | 2834 | 2730 | 3056 | N.S. | 2874 | 463·9 |
| Pooled | 2571 | 2622 | 2723 | N.S. | 2639 | 529·1 |

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**Crop :- Paddy** (*Ist Crop*). **Ref :- Ms. 64(49).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'CM'.**

Object : To compare the effect of drilling with heavy manuring Vs transplanting with normal manuring.

## 1. BASAL CONDITIONS :

(i) (a) Paddy, Paddy, G.M. (b) G.M. (c) Nil. (ii) Laterite with loamy in texture. (iii) 13.5 64. (iv) (a) 5 ploughings and levelling. (b) Drilling. (c) 86 Kg/ha. (d) 20 cm. between rows (e) N.A. for drilling. (a) Ploughing and puddling 5 rounds. (b) Transplanting, (c) —. (d) 20 cm.×20cm. (e) 2 for transplanting. (v) As per treatments. (vi) PTB-9 (Medium). (vii) Unirrigaied. (viii) Weeding in drilled plots and interculturing in transplanted plots. (ix) 254 cm. (x) 11.10.64.

## 2. TREATMENTS :

4 cultural-cum-manurial treatments : $M_1$=Drilling with heavy manuring, $M_2$=$M_1$+top dressing with G.L.M. at 5683 Kg/ha., $M_3$=Transplanting with normal manuring and $M_4$=Transplanting with heavy manuring.

Heavy manuring : F.Y.M. at 247 Q/ha.+59·3 Kg/ha. of $P_2O_5$ as Super+61·8 Kg/ha. of $K_2O$ as Mur. Pot. +burnt earth at 49·4 Q/ha.+59·3 Kg/ha. of N as A/S.

Narmal manuring : G.L.M. at 56·8 Q/ha.+34 Kg/ha. of $P_2O_5$ as Super+24·8 Kg/ha. of $K_2O$ as Mur. Pot. +29·6 Kg/ha. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 6·1 m.×7·6 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination was found rather poor in all drilled plots due to lack of moistures. (ii) Mild attack of leaf roller and sprayed with folidol. (iii) Grain and straw yield. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 3534 Kg/ha. (ii) 209·5 Kg/ha. (iis) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ |
|---|---|---|---|---|
| Av. yield | 2852 | 2738 | 4162 | 4384 |

C D.=257·8 Kg/ha.

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**Crop :- Paddy** **Ref :- Ms. 61(42), 62(20), 63(11), 64(1), 65(27).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'CM'.**

Object :—To find the residual effect of digging, if any, in the Chineese, Jap. and local method of Paddy cultivation.

1. BASAL CONDITIONS :

(i) (a) Paddy –G.M. (b) G.M. (c) Nil. (ii) Laterite, loamy in texture. (iii) N.A./7.7.61; N.A./24.7.62; 10.6.63/22.7.63 ; 21.7.64/16.6.64 ; 22.5.65/24.6.65. (iv) (a) 5 ploughings. (b) Transplanting. (c) —. (d) 25 cm.×23 cm. (e) 2 to 3. (v) Inorganic fertilisers and bulky manures applied. (vi) PTB—9 , M.G.L—1. (vii) Unirrigated. (viii) Nil for 61(42), 62(20) and 64(1) Intercultivation for 63(11) ; hand weeding for 65(27). (ix) 531 cm.; 356 cm.; 264 cm.; 234 cm.; 254 cm. (x) 4.11.61 ; 4.11.62 ; 28.10.63 ; 5.11.64 ; 21.10.65.

2. TREATMENTS ;

3 cultural cum manurial treatments :

| Basal dressing | $T_1$=Local improved method | $T_2$=Jap. method | $T_3$=Chineese method |
|---|---|---|---|
| | 56·0 Q/ha. of G.L. | 67·2 Q/ha. of G.L.+14·8 C.L/ha. of F.Y.M. | Digging upto 46 cm. and mixing the layer in 3 layers with 502·1 Q/ha. of F.Y.M. |
| At. planting | 33·6 Kg/ha. of $P_2O_5$ as Super+33·6 Kg/ha. of $K_2O$ as Mur. Pot.+22·4 Kg/ha. of N as A/S. | 17·9 Kg/ha. of $P_2O_5$ as Super+22·4 Kg/ha. of N as A/S. | 44·8 Kg/ha. of $P_2O_5$ as Super+44·8 Kg/ha. of $K_2O$ as Mur. Pot.+44·8 Kg/ha. of N as A/S. |
| Top dressing | 11-2 Kg/ha. of N as A/S at germination. | 17·9 Kg/ha. of $P_2O_5$ as Super+22·4 Kg/ha. of N as A/S at germination. | 44·8 Kg/ha. of N as A/S one month after planting +44·8 Kg/ha. of N as A/S at flowering. |

The above treatments were applied in 1959.

3. DESIGN :

(i) (a) R.B.D. (b) 3. (ii) 27·4 m.×9·1 m. (iii) 6. (iv) (a) and (b) 9·1 m.×9·1 m. (v) Yes. (iv) Yes.

### 4. GENERAL :

(i) Satisfactory. (ii) Moderate attack, of 'gallfly' and leaf roller sprayed with 'paramar for 61(42). Attack of gallfly sprayed with folidol for 62(20) ; Nil for other years. (iii) Yield of grain years. (iv) (a) 1961 – 1965. (b) Yes. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is present.

### 5. RESULTS :

(i) 2430 Kg/ha. (ii) 429 0 Kg/ha. [based on 8 d.f. made up of Treatments×years interaction]. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|
| Mean yield | 2345 | 2323 | 2622 |

C.D.=255·4 Kg/ha.

| Yeas | $T_1$ | $T_2$ | $T_3$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|
| 1961 | 1512 | 1570 | 1804 | * * | 1629 | 116·3 |
| 1962 | 1333 | 1493 | 2044 | * * | 1623 | 233·3 |
| 1963 | 1892 | 1811 | 2211 | * * | 1971 | 134·9 |
| 1964 | 3759 | 3469 | 3508 | N.S. | 3579 | 200 9 |
| 1965 | 3229 | 3273 | 3544 | N.S. | 3349 | 382·5 |
| Pooled | 2345 | 2323 | 2622 | * | 2430 | 429·0 |

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**Crop :- Paddy** **Ref :- Ms. 65(105), 65(106), 65(107).**

**Site :- Agri. Res. Stn., Mugad.** **Type :- 'CM'.**

Object :—To find out the best level of NPK that would give maximum yield with the best hybrids of Mysore state with different seed rates.

### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Clay loam. (iii) 9.6.65. (iv) (a) Ploughing, clad crushing, harrowing and grubbing. (b) Drilling with seed drill. (c) As per treatments. (d) 30 cm. between rows. (e) —. (v) 12.4.CL/ha. of F.Y.M. (vi) A—S 1944 for 65(105): B. S—2222 for 65(106) and C—Y 4 for 65(107). (vii) Unirrigated. (viii) Weeding, interculturing, roguing and manuring. (ix) 104 cm. (x) 24.12.65.

### 2. TRETMENTS :

**Main-plot treatments :**

3 levels of manures : $M_1$=44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$, $M_2$=67·2 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+33·6 Kg/ha. of $K_2O$ and $M_3$=89·6 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$.

**Sub-plot treatments :**

3 seed rates : $S_1$=67, $S_2$=90 and $S_3$=112 Kg/ha.

### 3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) 7·3 m.×6·1 m. (b) 6·1 m.×4·9 m. (v) 4 rows alround. (vi) Yes.

### 4. GENERAL :

(i) Fair. (ii) Blue beetle affected—sprayed with folidol. (iii) Yield of grain. (iv) (a) 1965. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

65(105)

(i) 3699 Kg/ha. (ii) (a) 352·3 Kg/ha. (b) 331·6 Kg/ha. (iii) Interaction M×S is significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | Mean |
|---|---|---|---|---|
| $M_1$ | 3363 | 3531 | 4625 | 3840 |
| $M_2$ | 2606 | 4120 | 3615 | 3447 |
| $M_3$ | 3615 | 4204 | 3615 | 3811 |
| Mean | 3195 | 3952 | 3952 | 3699 |

C.D. for S means at the same level of M=811·5 Kg/ha.
C.D. for M means at the same level of S=870·5 Kg/ha.

65(106)

(i) 3727 Kg/ha. (ii) (a) 637·9 Kg/ha. (b) 462·3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | Mean |
|---|---|---|---|---|
| $M_1$ | 2943 | 4625 | 4709 | 4092 |
| $M_2$ | 2606 | 3784 | 3952 | 3447 |
| $M_3$ | 3531 | 3447 | 3952 | 3643 |
| Mean | 3027 | 3952 | 4204 | 3727 |

65(107)

(i) 4326 Kg/ha. (ii) (a) 453·4 Kg/ha. (b) 389·6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | Mean |
|---|---|---|---|---|
| $M_1$ | 3531 | 4709 | 4961 | 4400 |
| $M_2$ | 3868 | 4204 | 4793 | 4288 |
| $M_3$ | 4036 | 4297 | 4540 | 4291 |
| Mean | 3812 | 4403 | 4765 | 4326 |

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**Crop :- Paddy.** **Ref :- Ms. 60(168), 61(160), 62(15).**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'CM'.**

Object :– To study the comparative effects of Jhackersey, Japaneese, Chinees and local improved methods on Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. for 60(168) and 61(160) and 22·4 Kg/ha. of $P_2O_5$ for 62(15). (ii) Red loam. (iii) 14.7.60/7.8.60 ; 18.7.61/17.8.61 ; 11.7.62/7.8.62. (iv) (a) 5 ploughings. (b) Transplanting. (c) N,A. (d) and (e) As per treatments. (v) Nil. (vi) SR. 26 B. (medium). (vii) Irrigated. (viii) Passing Jap. paddy cultivator 15 days after planting+hand weeding 30 days after planting. (ix) 33 cm. ; 51 cm. ; 37 cm. (x) 29.11.60 ; 18.12.61 ; 19.11.62.

2. TREATMENTS :

4 methods of cultivation : $T_1$=Jhackersey : 67·2 Q/ha. G.M.+33·6 Kg/ha. of N in 3 doses with a spacing of 23 cm.×23 cm. and 1 seedling/hole, $T_2$=Japanese : 67·2 Q/ha. G.M.+112 Kg/ha of A/S and 112 Kg/ha. Super at planting and 112 Kg/ha. of A/S one month after planting with a spacing of 23 cm.×23 cm. and 3 seedlings/hole. $T_3$=Chinese : 500 Q/ha. Compost+112 Kg/ha. N in 4 doses+44·8 Kg/ha. of N+44·8 Kg/ha. of $P_2Q_5$ in one dose at planting with a spacing of 15 cm.×15 cm. with 2 seedlings/hole and $T_4$=Local improved : 67·2 Q/ha. of G.M.+33·6 Kg/ha. of N in 3 doses+22·4 Kg/ha. $P_2O_5$ in one dose at planting with a spacing of 20 cm.× 20 cm. and 3·4 seedlings/hole.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) Varies from treatment to treatment. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1960 to 1962. (b) No. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments ×years interaction is present.

5. RESULTS :

(i) 3494 Kg/3a. (ii) 954·4 Kg/ha. (based on 6 d.f. made up of treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment : | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield : | 3375 | 3685 | 3473 | 3442 |

| Years | $T_1$ | $T_2$ | $T_3$ | $T_4$ | *Sig.* | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|
| 1960 | 3730 | 4078 | 3655 | 3301 | N.S. | 3691 | 770·0 |
| 1961 | 4167 | 4603 | 4447 | 3919 | N.S. | 4284 | 435·8 |
| 1962 | 2227 | 2374 | 2316 | 3107 | ** | 2506 | 416·0 |
| Pooled | 3375 | 3685 | 3473 | 3442 | N.S. | 3494 | 954·4 |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 63(4), 64(13).**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'CM'.**

Object :—To study the optimum dose of manure and spacing required for short duration variety of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) G.M. (c) 22·4 Kg/ha. of $P_2O_5$ as Super ; Nil. (ii) Red sandy loam. (iii) 15.7.63 ; 29.7.64/5.9.64. (iv) (a) 3 to 5 ploughings. (b) Transplanting. (c) —. (d) As per treatments. (e) 1. (v) 56·0 Q/ha. of G.M. (vi) $CH_2$ (early). (vii) Irrigated. (viii) Passing of J.P.C. (ix) 31 cm. ; 53 cm. (x) 5.12.63 ; 4.12.64.

2. TREATMENTS :

Same as in exp.. no. 63(3) given below.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 9 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 7·3 m.×3·7 m. (b) 3·7 m.×2·4 m. (v) and (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Incidence of stem borer in 63(4). Folidol sprayed. Blitex and folidol sprayed as a precautionery measure in 64(13). (iii) Yield of grain. (iv (a) 1963 to 1964. (b) No. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Main as well as sub-plot error variances are homogeneous and interaction of treatments with years is absent in both.

5. RESULTS :

(i) 2270 Kg/ha. (ii) (a) 1362·5 Kg/ha. [based on 5 d,f. made up of pooled error and interaction of S× years]. (b) 521·2 Kg/ha. [based on 76 d.f. made up of pooled error and interactions of N, P, N×P, N×S, P×S with years]. (iii) Interaction P×S alone is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $P_1$ | $P_2$ | $P_3$ | $S_1$ | $S_2$ | Mean |
|---|---|---|---|---|---|---|
| $N_1$ | 2629 | 2312 | 2102 | 2556 | 2140 | 2348 |
| $N_2$ | 2345 | 2363 | 1943 | 2337 | 2097 | 2217 |
| $N_3$ | 2182 | 2175 | 2378 | 2416 | 2073 | 2245 |
| Mean | 2385 | 2283 | 2141 | 2436 | 2103 | 2270 |
| $S_1$ | 2779 | 2374 | 2156 | | | |
| $S_2$ | 1991 | 2193 | 2126 | | | |

C.D. for P means at the same level of S=346·5 Kg/ha.
C.D. for S means at the same level of P=722·8 Kg/ha.

| Years | $S_1$ | $S_2$ | Sig. | G.M. | S.E./Main/plot |
|---|---|---|---|---|---|
| 1963 | 2505 | 1981 | N.S. | 2243 | 1943·6 |
| 1964 | 2368 | 2226 | N.S. | 2297 | 609·1 |
| Pooled | 2436 | 2103 | N.S. | 2270 | 1362·5 |

| Years | $N_1$ | $N_2$ | $N_3$ | Sig. | $P_1$ | $P_2$ | $P_3$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1963 | 2300 | 2235 | 2194 | N.S. | 2287 | 2326 | 2116 | N.S. | 2243 | 644·6 |
| 1964 | 2396 | 2199 | 2296 | N.S. | 2484 | 2241 | 2166 | N.S. | 2297 | 448·1 |
| Pooled | 2348 | 2217 | 2245 | N.S. | 2385 | 2283 | 2141 | N.S. | 2270 | 521·2 |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 63(3), 64(12).**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'CM'.**

Object :—To study the optimum dose of manure and spacing required for medium duration variety of Paddy.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) G.M. (c) 22·4 Kg/ha. of $P_2O_5$ as Super ; Nil. (ii) Red sandy loam (iii) 15.7.63 ; 14.7.64/7.9.64. (iv) (a) 3 to 5 ploughings. (b) Transplanting. (c) —. (d) As per treatments. (e) 1. (v) 56·0 Q/ha. of G.M. (vi) S.R. 26 B (medium). (vii) Irrigated. (viii) Passing J.P.C. (ix) 31 cm. ; 55 cm. (x) 5.12.63 ; 26.12.64.

## 2. TREATMENTS :

**Main-plot treatments :**

2 spacing : $S_1$=15 cm.×23 cm. and $S_2$=23 cm.×23 cm.

**Sub-plot treatments :**

(1) 3 levels of N as A/S : $N_1$=33·6, $N_2$=50·4 and $N_3$=67·2 kg/ha.

(2) 3 levels of $P_2O_5$ as Super : $P_1$=22·4, $P_2$=33·6 and $P_3$=44·8 Kg/ha.

$P_2O_5$ applied in one dose at planting and N applied in two equal doses 1st at the time of planting and 2nd top dressed one month after.

## 3. DESIGN

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 9 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 8·4 m. ×3·6 m. ; 8·7 m.×3·2 m. (b) 6·7m.×3·4 m. ; 8·2 m.×2·7 m. (v) Yes. (vi) Yes.

## 4. GENERAL INFORMATION :

(i) Satisfactory. (ii) Incidence of stem borer in 63(3). Incidence of stem borer and mild attack of Helmin thosphorium in 64(12). Spraying with Folidol. (iii) Yield of grain. (iv) (a) 1963—1964. (b) No. (c) Results of combined analysis given under 5. Results. (v) Nil. (vi) Nil. (vii) Main as well as sub-plot error variances are homogeneous and Treatments×years interaction is absent in both.

## 5. RESULTS :

(i) 2678 Kg/ha. (a) 1174·1 Kg/ha. (based on 5 d.f. made up of pooled error and interaction of S×Years). (b) 453·5 Kg/ha. (based on 76 d.f. made up of pooled error and interaction of Treatment components N, P, N×P, N×S, P×S with years). (iii) Interaction N×S alone is significant. (iv) Av. yield of grain in Kg/ha.

| | $P_1$ | $P_2$ | $P_3$ | $S_1$ | $S_2$ | Mean |
|---|---|---|---|---|---|---|
| $N_1$ | 2698 | 2582 | 2897 | 2436 | 3016 | 2726 |
| $N_2$ | 2633 | 2737 | 2714 | 2686 | 2703 | 2695 |
| $N_3$ | 2700 | 2703 | 2440 | 2577 | 2652 | 2614 |
| Mean | 2677 | 2674 | 2684 | 2566 | 2790 | 2678 |
| $S_1$ | 2650 | 2524 | 2524 | | | |
| $S_2$ | 2704 | 2823 | 2843 | | | |

C.D. for N means at the same level of S=299·4 Kg/ha.
C.D. for S means at the same level of N=627·2 Kg/ha.

| Years | $S_1$ | $S_2$ | Sig. | G.M. | S.E./main plot |
|---|---|---|---|---|---|
| 1963 | 2748 | 3268 | N.S. | 3008 | 695·3 |
| 1964 | 2385 | 2313 | N.S. | 2349 | 1334·2 |
| Pooled | 2566 | 2790 | N.S. | 2678 | 1174·1 |

| Years | $N_1$ | $N_2$ | $N_3$ | Sig. | $P_1$ | $P_2$ | $P_3$ | Sig. | G.M. | S.E./sub-plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1963 | 3092 | 3028 | 2904 | N.S. | 2968 | 2959 | 3097 | N.S. | 3008 | 498·4 |
| 1964 | 2360 | 2362 | 2325 | N.S. | 2387 | 2389 | 2271 | N.S. | 2349 | 479·3 |
| Pooled | 2726 | 2695 | 2614 | N.S. | 2677 | 2674 | 2684 | N.S. | 2678 | 453·5 |

**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 60(MAE).**

**Site :- MAE Centre, Mercara.** **Type :- 'CM'.**

Object :—Type VII To study the effect of different cultural practices and manures on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Heavy loam. (iii) As per treatments. (iv) (a) 6 ploughings and final levelling. (b) Broadcast. (c) 22 Kg/ha. (d) and (e) As per treatments. (v) 56 Q/ha. of F.Y.M. (vi) B A.M.—3 (7½ months duration). (vii) Irrigated. (viii) Weeding and interculturing by rotary weeder. (ix) 394 cm. (x) 18.1.61 to 23.1.61.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1), (2) and (3)

(1) 3 dates of planting: $D_1$=1.7.1960, $D_2$=16.7.1960 and $D_3$=1.8.1960.

(2) No. of seedling per hole : $R_1=2$, $R_2=4$ and $R_3=6$ seedlings/hole.

(3) 3 spacings : $S_1$=15 cm. × 15 cm., $S_2$=20 cm. × 20 cm. and $S_3$=25 cm. × 25 cm.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 2 levels of N as A/S : $N_0=0$ and $N_1$=44·8 Kg/ha.

(2) 2 levels of $P_2O_5$ : $P_0=0$ and $P_1$=44·8 Kg/ha.

3. DESIGN :

(i) Split-plot Confd. (ii) (a) 9 main-plots/block ; 3 blocks/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 10·1 m × 5·0 m. (b) 9·3 m. × 4·3 m. for $S_1$, 8·9 m. × 4·1 m. for $S_2$ and 8·9 m. × 4·1 m. for $S_3$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) to (c) No. (v) and (vi) N.A. (vii) Nil.

5. RESULTS :

(i) 3443 Kg/ha. (ii) (a) 995·2 Kg/ha. (b) 345·9 Kg/ha. (iii) Main effect of N, P are highly significant. Interactions S×N, D×N, S×P and D×S×P are significant. (iv) Av. yield of grain in Kg/ha.

| | $D_1$ | $D_2$ | $D_3$ | $R_1$ | $R_2$ | $R_3$ | $S_1$ | $S_2$ | $S_3$ | $P_0$ | $P_1$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $N_0$ | 3874 | 3846 | 3191 | 3652 | 3588 | 3671 | 3615 | 3754 | 3542 | 3717 | 3557 | 3637 |
| $N_1$ | 3246 | 3625 | 2878 | 3394 | 3200 | 3156 | 3016 | 3302 | 3432 | 3357 | 3143 | 3250 |
| Mean | 3560 | 3735 | 3034 | 3523 | 3394 | 3713 | 3315 | 3528 | 3487 | 3537 | 3350 | 3443 |
| $P_0$ | 3726 | 3781 | 3104 | 3560 | 3551 | 3500 | 3505 | 3625 | 3481 | | | |
| $P_1$ | 3395 | 3689 | 2965 | 3486 | 3237 | 3326 | 3125 | 3431 | 3493 | | | |
| $S_1$ | 3366 | 3542 | 3037 | 3874 | 3348 | 2723 | | | | | | |
| $S_2$ | 3422 | 4077 | 3084 | 3661 | 3274 | 3649 | | | | | | |
| $S_3$ | 3892 | 3586 | 2982 | 3034 | 3560 | 3867 | | | | | | |
| $R_1$ | 3477 | 3837 | 3255 | | | | | | | | | |
| $R_2$ | 3311 | 3957 | 2913 | | | | | | | | | |
| $R_3$ | 3892 | 3411 | 2935 | | | | | | | | | |

C.D. for N or P marginal means =135·2 Kg/ha.
C.D. for N or P means at the same level of D or S =234·0 Kg/ha.
C.D. for D or S means at the same level of N or P=595·9 Kg/ha.

**Crop :- Paddy** (*Kharif*). **Ref :- Ms. 63(7).**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'CMV',**

Object :— To study the effect of early, normal and late planting on indica-Japanica Hybrids under the usual and heavy manuring.

1. BASAL CONDITIONS :

(i) (a) Paddy after Paddy. (b) G.M. (c) 22·4 Kg/ha. of $P_2O_5$ as Super. (ii) Red sandy loam. (iii) As per treatments. (iv) (a) 5 ploughings. (b) As per treatments. (c) —. (d) 23 cm. × 23 cm. (e) 1. (v) 56·0 Q/ha. of G.M. (vi) As per treatments. (vii) Irrigated. (viii) 2 hand weedings and passing J.P.C. cultivater once. (ix) 37 cm. (x) As per treatments.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1) and (2).

(1) 3 methods of planting : $P_1$=Early, $P_2$=Normal and $P_3$=Late planting.

(2) 2 levels of manuring : $M_1$=heavy and $M_2$=usual manuring.

**Sub-plot treatments :**

3 varieties : $V_1$=S—1904, $V_2$=S—2222 and $V_3$=S—1092.

Other details N.A.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication, 3 sub-plots/main-plot. (b) 9·1 m. × 57·6 m. (iii) 4. (iv) (a) 9·1 m. × 3·2 m. (b) 8·2 m. × 2·7 m. (v) and (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Insect pests-sprayed folidol as a precautionary measure. (iii) Yield of grain. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 2525 Kg/ha. (ii) (a) 532·6 Kg/ha. (b) 579·8 Kg/ha. (iii) Main effects of P and V are highly significant and interaction P × V is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $P_1$ | $P_2$ | $P_3$ | $V_1$ | $V_2$ | $V_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $M_1$ | 2479 | 2690 | 2245 | 1611 | 3088 | 2714 | 2471 |
| $M_2$ | 2692 | 2849 | 2193 | 1656 | 3098 | 2981 | 2578 |
| Mean | 2586 | 2770 | 2219 | 1634 | 3093 | 2848 | 2525 |
| $V_1$ | 861 | 2385 | 1655 | | | | |
| $V_2$ | 3761 | 2947 | 2570 | | | | |
| $V_3$ | 3134 | 2977 | 2432 | | | | |

C.D. for P marginal means =322·2 Kg/ha.
C.D. for V marginal means =338·3 Kg/ha.
C.D. for V means at the same level of P=585·9 Kg/ha.
C.D. for P means at the same level of V=575·8 Kg/ha.

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**Crop :- Paddy** (*Rabi*). **Ref :- Ms. 64(32).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'CMV'.**

Object :—To study the optimum spacing and dose of application of fertilizers to different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy after Paddy. (b) Paddy. (c) Compost at 49·4 C.L./ha. (ii) Grey soil. (iii) 20 to 22-2-64. (iv) (a) 3 ploughings. (b) Transplanting. (c) 15 Kg/ha. (d) As per treatments. (e) 2. (v) Compost at 49·4 C.L./ha.+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$. (vi) As per treatments. (viii) Irrigated. (viii) 3 weedings by rotary weeder and one hand weeding. (ix) N.A. (x) 26 and 27.5.64.

2. TREATMENTS :

**Main-plot treatments :**

4 levels of N as A/S : $N_0$=0, $N_1$=33·6, $N_2$=67·2 and $N_3$=100·9 Kg/ha.

**Sub-plot treatments :**

All combinations of (1) and (2).

(1) 4 spacings : $S_1$=23 cm.×15 cm., $S_2$=23 cm.×23 cm., $S_3$=23 cm.×30 cm. and $S_4$=30 cm.×30 cm.

(2) 2 varieties : $V_1$=S—1043 and $V_2$=China 10.

N applied in two equal doses at planting and 40 days after planting.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/replication, 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 4·6 m.×4·6 m. (b) 3·7 m.×3·7 (v) 46 cm.×46 cm. (vi) Yes.

4. GENERAL :

(i) Fair, lodging in $N_3$ plots. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964-65. (b) No. (c) Nil. (v) and (vii) Nil.

5. RESULTS :

(i) 4189 Kg/ha. (ii) (a) 1070·3 Kg/ha. (b) 388·2 Kg/ha. (iii) N effect is significant. Main effect of V and S are highly significant. Interaction V×S is significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $N_0$ | $N_1$ | $N_2$ | $N_3$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $V_1$ | 4208 | 4121 | 3711 | 3460 | 3270 | 4086 | 4215 | 3931 | 3875 |
| $V_2$ | 4593 | 4507 | 4516 | 4399 | 3917 | 4471 | 4890 | 4737 | 4504 |
| Mean | 4401 | 4314 | 4114 | 3929 | 3593 | 4278 | 4552 | 4334 | 4189 |
| $N_0$ | 3712 | 3632 | 3631 | 3399 | | | | | |
| $N_1$ | 4541 | 4383 | 4182 | 4006 | | | | | |
| $N_2$ | 4792 | 4584 | 4588 | 4246 | | | | | |
| $N_3$ | 4560 | 4655 | 4054 | 4067 | | | | | |

C.D. for N marginal means =605·3 Kg/ha.
C.D. for S marginal means =193·2 Kg/ha.
C.D. for V marginal means =136·6 Kg/ha.
C.D. for the body of V×S table=273·2 Kg/ha.

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 65(22).**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'I'.**

Object :— To study the effect of drying for about 10 days at peak tillering stage on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy, G.M., Paddy. (b) Paddy. (c) 56·0 Q/ha. of G.M.+33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (ii) Sandy loam. (iii) 22.6.65/28.7.65. (iv) (a) Ploughing, in corporation of G.M. by ploughing and puddling. (b) Transplanting. (c) 49 Kg/ha. (d) 20 cm.×20 cm. (e) N.A. (v) 56·0 Q/ha. of G.M.+ 67·2 Kg/ha. of N as A/S+44·8 Kg/ha. of $P_2O_5$ as Super+44·8 Kg/ha. of $K_2O$ as Mur. Pot. (vi) S. 1092 late. (vii) Irrigated. (viii) Hand weeding and working J.P.C. weeder. (ix) 29 cm. (x) 20.12.65.

2. TREATMENTS :

4 irrigational treatments : $T_1$=Control (usual irrigation), $T_2$=Continuous irrigation+surface drying for 10 days at peak tillering stage, $T_3$=Keeping water depth of 5·1 cm. and $T_4$= Keeping soil saturated (No standing water).

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 3. (iv) (a) 8·3 m.×4·3 m. (b) 7·6 m.×3·4 m. (v) 2 rows on each side. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) to (c) No. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3076 Kg/ha. (ii) 205·8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 3467 | 3583 | 3130 | 2123 |

C.D.=411·0 Kg/ha.

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**Crop :- Paddy (*Kharif* ).** **Ref :- Ms. 60(167), 61(159), 62(17).**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'I'.**

Object :— To find the effect of different intervals of irrigation on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) G.M. (c) 28·0 Kg/ha. of N for 60 (167) ; 22·4 Kg/ha. of $P_2O_5$ for 61 and 62. (ii) Red sandy loam. (iii) 14.10.60/5.8.60 ; 26.6.61/26.7.61 ; 11.7.62/2.8.62. (iv) (a) 3 to 4 ploughings, 1 puddling and leveling. (b) Transplanting. (c) 22 Kg/ha. (d) 25 cm.×23 cm. (e) 2 to 3. (v) G.M. 45 to 56 Q/ha.+22·4 Kg/ha. of $P_2O_5$ to G.M. at sowing+110 Q/ha. of F.Y.M.+33·6 Kg/ha. of N in 2 doses for 60(167) and 61(159) ; 672 Q/ha. of G.M.+22·4 Kg/ha. of $P_2O_5$+33·6 Kg/ha. of N as A/S+11·2 Kg/ha. of N as top dressing for 62(17). (vi) S.R. 26 B (medium). (vii) As per treatments. (viii) 2 hand weedings. (ix) 33 cm. ; 51 cm. ; 37 cm. (x) 25.11.60 ; 18.11.61 ; 9.11.62.

2. TREATMENTS :

5 irrigational treatments : $I_1$=Irrigation daily, $I_2$=Water changed daily, $I_3$=Irrigation at an interval of 4 days, $I_4$=Irrigation at an interval of 8 days and $I_5$=Irrigation as and when necessary to keep the soil moist.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. for 60 and 61 ; 17·8 m.×9·1 m. for 62. (iii) 4. (iv) (a) 3·9 m.×9·8 m. ; 3·9 m.×9·8 m. ; 9·1 m.×3·6 m. (b) 3·3 m.×8·9 m. ; 3·0 m.×8·0 m. ; 8·2 m.×2·8 m. (v) 25 cm.×46 cm ; 46 cm.×92 cm. ; 46 cm.×36 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Spraying of folidol ; Nil ; Attack of stem borer. (iii) Yield of grain. (iv) (a) 1960 to 62. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent, results of the individual experiments are presented below.

## 5. RESULTS :

**60(167)**

(i) 3601 Kg/ha. (ii) 604·7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $I_1$ | $I_2$ | $I_3$ | $I_4$ | $I_5$ |
|---|---|---|---|---|---|
| Av. yield | 3864 | 3694 | 3312 | 3100 | 4034 |

**61(159)**

(i) 4899 Kg/ha. (ii) 310·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $I_1$ | $I_2$ | $I_3$ | $I_4$ | $I_5$ |
|---|---|---|---|---|---|
| Av. yield | 4836 | 4836 | 5256 | 4521 | 5046 |

**62(17)**

(i) 4069 Kg/ha. (ii) 335·6 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $I_1$ | $I_2$ | $I_3$ | $I_4$ | $I_5$ |
|---|---|---|---|---|---|
| Av. yield | 4329 | 4263 | 3986 | 3573 | 4193 |

C.D.=517·1 Kg/ha.

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 63(32).**

**Site :- Agri. College, Hebbal.** **Type :- 'D'.**

Object :—To find out efficiency and advantages of weedicides in controlling weeds in paddy fields.

## 1. BASAL CONDITIONS :

(i) (a) Paddy after Paddy. (b) Paddy. (c) 12·35 C.L./ha. of F.Y.M.+22·4 Q/ha. of G.M.+33·6 Kg/ha. of N as A/S+35·9 Kg/ha. of $P_2O_5$ as Super. (ii) (a) and (b) N.A. (iii) 27.8.63. (iv) (a) Ploughing twice, puddling twice and passing plank harrow once. (b) Transplanting, (c) 34 Kg/ha. (e) 25 cm. between rows. (v) 62 Q/ha. of F.Y.M.+16·8 Q/ha. of G.M.+44·5 Kg/ha. of A/S+79·1 Kg/ha. of Super. (vi) S. 661. (vii) Irrigated. (viii) As per treatments. (ix) N.A. (x) 8.1.64.

## 2. TREATMENTS :

5 spraying treatments : $T_0$=Control, $T_1$=Passing rotary weeder only, $T_2$=One spraying with stanvac F.34, $T_3$=2 spraying with stanvac F.34 and $T_4$=3 spraying with stanvac F.34.

Ist spraying was done 30 days after transplanting and 2nd and 3rd sprays were done at an interval of 20 days.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 10·1 m.×10·1 m. (b) 9·5 m.×9·5 m. (v) 30 cm.×30 cm. (vi) Yes.

## 4. GENERAL :

(i) Good, (ii) Mild attack of stem borer and Helminthosporium were observed. (iii) Yield of grain. (iv) (a) 1963 to 1964. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Expt. failed in 1964.

## 5. RESULTS :

(i) 4248 Kg/ha. (ii) 513 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. yield | 4242 | 4368 | 4130 | 4368 | 4130 |

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**Crop :- Paddy** **Ref :- Ms. 60(26), 61(157,.**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'D'.**

Object :—To find the effect of chemical methods (by spraying herbicide) Vs. mechanical methods of controlling weeds of Paddy crops.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 9·9 C.L./ha. of F.Y.M.+33·6 Kg/ha. of N as A/S+28 Kg/ha. of $P_2O_5$ as Super for 60(27); Nil for 61(57). (ii) Clay loam. (iii) 15.12.60/N.A. ; 20.6.61/21.7.61. (iv) (a) Ploughing and puddling. (b) Transplanting. (c) 34 Kg/ha. (d) 25 cm.×15 cm. (e) 3. (v) 9·9 C.L./ha. of Compost +39·2 Kg/ha, of N as Urea+28 Kg/ha. of $P_2O_5$ as Super for 60(26) ; Sesbania at 2242 Kg/ha.+22·4 Kg/ha. of N as A/S+44·8 Kg/ha. of Super for 61(57). (vi) S—8317 (medium) ; S—1032 (long duration). (vii) Irrigated. (viii) As per treatments. (ix) 10 cm.; N.A. (x) 23.5.61 ; 27.12.61.

2. TREATMENTS :

5 chemical and mechanical treatments : $T_1$=Hand weeding once in 20 days, $T_2$=Rotary weeding once in 20 days, $T_3=T_1+T_2$, $T_4$=Spraying 2, 4—D (1·25% solⁿ. exact quantity N.A.)+stirring and $T_5$=Spraying only.

In plots where spraying was carried on water was drained off 4 days prior to spraying and water was unpoured 3 days after spraying.

In plots of spraying and stirring weeds the plots are stirred 24 hrs. after spraying by a locally prepared brush.

In $T_1$, $T_2$ and $T_3$ weedings started one month after planting.

3. DESIGN :

(i) R.B.D., L. sq. (ii) (a) 5. (b) 50·3 m.×7·9 m. ; 41·5 m.×10·1 m. (iii) 4, 5. (iv) (a) 7·9 m.×10·1 m. (b) 7·6 m.×9·8 m. ; 7·5 m.×9·6 m. (v) 15 cm.×15 cm. ; 23 cm.×23 cm. (vi) Yes.

4. GENERAL :

(i) Normal uniform flowering was observed in all plots except 2-4-D treated plots for 60(26) ; healthy for 61(57). (ii) Light neck rot disease was observed in 60(26) ; nil for 61(57). (iii) No. and length of tiller and yield of grain. (iv) (a) 1960 to 1961. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 3715 Kg/ha. (ii) 354·1 Kg/ha. [based on 28 d.f. made up of pooled error and Treatments×years interaction]. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. yield | 4201 | 3864 | 3920 | 3235 | 3353 |

C.D.=355·3 Kg/ha.

| Years | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|
| 1960 | 3394 | 3251 | 3177 | 2392 | 2521 | * | 2947 | 437·5 |
| 1961 | 4846 | 4354 | 4515 | 3909 | 4019 | ** | 4329 | 282·2 |
| Pooled | 4201 | 3864 | 3920 | 3235 | 3353 | ** | 3715 | 354·1 |

**Crop :- Paddy (*II crop*).** **Ref :- Ms. 63(51).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'D'.**

Object :—To study the effect of spraying different insecticides in controlling Paddy stem borer.

### 1. BASAL CONDITIONS :

(i) (a) Paddy after Paddy. (b) Paddy, (c) G.L. at 55·8 Q/ha.+34 Kg/ha. of $P_2O_5$ as Super+28·4 Kg/ha. of $K_2O$ as Mur. Pot+11·4 Kg/ha. of N as A/S. (ii) (a) and (b) Laterite, loamy in texture. (iii) 27.9.63/ 2.11.63, (iv) (a) 5 ploughings and puddlings. (b) Transplanting. (c) —. (d) 20 cm.×20 cm. (e) 2. (v) C.M. at 113 Q/ha.+34 Kg/ha. of $P_2O_5$ as Super+28·4 Kg/ha. of $K_2O$ as Mur. Pot.+11·4 Kg/ha. of N as A/S. (vi) MGL—7 (medium). (vii) Irrigated. (viii) Interculturing. (ix) 52 cm. (x) 24.1.64.

### 2. TREATMENTS :

8 insecticidal treatments : $T_0$—Control, $T_1$=Demecron 0·02% 3·4 C.C., $T_2$=Endrin 0·05% 33·9 CC, $T_3$= Folidol 0·05% 13·5 CC, $T_4$=Paramar 0·05% 13·5 CC, $T_5$=Rogor 0·05% 17·0 CC, $T_6$=Sevin 0 05% 8 grams and $T_7$=G. Simathion 0·075% 20 CC.

All insecticides were dissolved in 13·6 litres of water. 2 sprayings of each insecticide on 23.11.1963 and 18.12.1960.

Top dressing with 11·4 Kg/ha. of N as A/S on 27.11.1963., 2nd top dressing at the same rate at the time of short blade.

### 3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N A. (iii) 5. (iv) (a) and (b) 6·1 m.×6·7 m. (v) Nil. (vi) Yes.

### 4. GENERAL :

(i) Good. (ii) Sprayed as for treatments. (iii) Grain weight. (iv) (a) 1966 (modified every year). (b) No. (c) Nil. (v) to (vii) Nil.

### 5. RESULTS :

(i) 2991 Kg/ha. (ii) 148·6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 2941 | 2869 | 2915 | 3239 | 3225 | 2881 | 2825 | 3033 |

C.D.=192·4 Kg/ha.

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**Crop :- Paddy (*II crop*).** **Ref :- Ms. 64(48).**

**Site :- Paddy Breeding Stn., Mangalore.** **Type :- 'D'.**

Object :—To study the effect of spraying different insecticides in controlling Paddy stem borer.

### 1. BASAL CONDITIONS :

(i) (a) Paddy-Paddy. (b) Paddy. (c) G.L. at 56·8 Q/ha.+34 Kg/ha. of $P_2O_5$ as Super+28·4 Kg/ha. of $K_2O$ as Mur. Pot.+34 Kg/ha. of N as A/S. (ii) (a) and (b) Laterite, loamy in texture. (iii) 6.10.64/ 10.11.64. (iv) (a) Ploughing and puddling 5 rounds. (b) Transplanting. (c) —. (d) 20 cm.×20 cm. (e) 2. (v) C.M. at 11·7 Q/ha.+34 Kg/ha. of $P_2O_5$ as Super+28·4 Kg/ha. of $K_2O$ as Mur. Pot.+30 Kg/ha. of N as A/S. (vi) MGL—7 (medium). (vii) Irrigated. (viii) 1 interculturing. (ix) 48 cm. (x) 24.2.65.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) G.M. (c) 22·4 Kg/ha. of $P_2O_5$ as Super ; Nil. (ii) Red sandy loam (iii) 15.7.63 ; 14.7.64/7.9.64. (iv) (a) 3 to 5 ploughings. (b) Transplanting. (c) —. (d) As per treatments. (e) 1. (v) 56·0 Q/ha. of G.M. (vi) S.R. 26 B (medium). (vii) Irrigated. (viii) Passing J.P.C. (ix) 31 cm. ; 55 cm. (x) 5.12.63 ; 26.12.64.

2. TREATMENTS :

**Main-plot treatments :**

2 spacing : $S_1$=15 cm.×23 cm. and $S_2$=23 cm.×23 cm.

**Sub-plot treatments :**

(1) 3 levels of N as A/S : $N_1$=33·6, $N_2$=50·4 and $N_3$=67·2 kg/ha.

(2) 3 levels of $P_2O_5$ as Super : $P_1$=22·4, $P_2$=33·6 and $P_3$=44·8 Kg/ha.

$P_2O_5$ applied in one dose at planting and N applied in two equal doses 1st at the time of planting and 2nd top dressed one month after.

3. DESIGN

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 9 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 8·4 m. ×3·6 m. ; 8·7 m.×3·2 m. (b) 6·7m.×3·4 m. ; 8·2 m.×2·7 m. (v) Yes. (vi) Yes.

4. GENERAL INFORMATION :

(i) Satisfactory. (ii) Incidence of stem borer in 63(3). Incidence of stem borer and mild attack of Helminthosphorium in 64(12). Spraying with Folidol. (iii) Yield of grain. (iv) (a) 1963—1964. (b) No. (c) Results of combined analysis given under 5. Results. (v) Nil. (vi) Nil. (vii) Main as well as sub-plot error variances are homogeneous and Treatments×years interaction is absent in both.

5. RESULTS :

(i) 2678 Kg/ha. (a) 1174·1 Kg/ha. (based on 5 d.f. made up of pooled error and interaction of S×Years). (b) 453·5 Kg/ha. (based on 76 d.f. made up of pooled error and interaction of Treatment components N, P, N×P, N×S, P×S with years). (iii) Interaction N×S alone is significant. (iv) Av. yield of grain in Kg/ha.

| | $P_1$ | $P_2$ | $P_3$ | $S_1$ | $S_2$ | Mean |
|---|---|---|---|---|---|---|
| $N_1$ | 2698 | 2582 | 2897 | 2436 | 3016 | 2726 |
| $N_2$ | 2633 | 2737 | 2714 | 2686 | 2703 | 2695 |
| $N_3$ | 2700 | 2703 | 2440 | 2577 | 2652 | 2614 |
| Mean | 2677 | 2674 | 2684 | 2566 | 2790 | 2678 |
| $S_1$ | 2650 | 2524 | 2524 | | | |
| $S_2$ | 2704 | 2823 | 2843 | | | |

C.D. for N means at the same level of S=299·4 Kg/ha.
C.D. for S means at the same level of N=627·2 Kg/ha.

| Years | $S_1$ | $S_2$ | Sig. | G.M. | S.E./main plot |
|---|---|---|---|---|---|
| 1963 | 2748 | 3268 | N.S. | 3008 | 695·3 |
| 1964 | 2385 | 2313 | N.S. | 2349 | 1334·2 |
| Pooled | 2566 | 2790 | N.S. | 2678 | 1174·1 |

| Years | $N_1$ | $N_2$ | $N_3$ | Sig. | $P_1$ | $P_2$ | $P_3$ | Sig. | G.M. | S.E./sub-plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1963 | 3092 | 3028 | 2904 | N.S. | 2968 | 2959 | 3097 | N.S. | 3008 | 498·4 |
| 1964 | 2360 | 2362 | 2325 | N.S. | 2387 | 2389 | 2271 | N.S. | 2349 | 479·3 |
| Pooled | 2726 | 2695 | 2614 | N.S. | 2677 | 2674 | 2684 | N.S. | 2678 | 453·5 |

**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 60(MAE).**

**Site :- MAE Centre, Mercara.** **Type :- 'CM'.**

Object :—Type VII To study the effect of different cultural practices and manures on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Heavy loam. (iii) As per treatments. (iv) (a) 6 ploughings and final levelling. (b) Broadcast. (c) 22 Kg/ha. (d) and (e) As per treatments. (v) 56 Q/ha. of F.Y.M. (vi) B A.M.—3 (7½ months duration). (vii) Irrigated. (viii) Weeding and interculturing by rotary weeder. (ix) 394 cm. (x) 18.1.61 to 23.1.61.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1), (2) and (3)

(1) 3 dates of planting : $D_1$=1.7.1960, $D_2$=16.7.1960 and $D_3$=1.8.1960.
(2) No. of seedling per hole : $R_1$=2, $R_2$=4 and $R_3$=6 seedlings/hole.
(3) 3 spacings : $S_1$=15 cm. × 15 cm., $S_2$=20 cm. × 20 cm. and $S_3$=25 cm. × 25 cm.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 2 levels of N as A/S : $N_0$=0 and $N_1$=44·8 Kg/ha.
(2) 2 levels of $P_2O_5$ : $P_0$=0 and $P_1$=44·8 Kg/ha.

3. DESIGN :

(i) Split-plot Confd. (ii) (a) 9 main-plots/block ; 3 blocks/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 10·1 m × 5·0 m. (b) 9·3 m. × 4·3 m. for $S_1$, 8·9 m. × 4·1 m. for $S_2$ and 8·9 m. × 4·1 m. for $S_3$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) to (c) No. (v) and (vi) N.A. (vii) Nil.

5. RESULTS :

(i) 3443 Kg/ha. (ii) (a) 995·2 Kg/ha. (b) 345·9 Kg/ha. (iii) Main effect of N, P are highly significant. Interactions S×N, D×N, S×P and D×S×P are significant. (iv) Av. yield of grain in Kg/ha.

| | $D_1$ | $D_2$ | $D_3$ | $R_1$ | $R_2$ | $R_3$ | $S_1$ | $S_2$ | $S_3$ | $P_0$ | $P_1$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $N_0$ | 3874 | 3846 | 3191 | 3652 | 3588 | 3671 | 3615 | 3754 | 3542 | 3717 | 3557 | 3637 |
| $N_1$ | 3246 | 3625 | 2878 | 3394 | 3200 | 3156 | 3016 | 3302 | 3432 | 3357 | 3143 | 3250 |
| Mean | 3560 | 3735 | 3034 | 3523 | 3394 | 3713 | 3315 | 3528 | 3487 | 3537 | 3350 | 3443 |
| $P_0$ | 3726 | 3781 | 3104 | 3560 | 3551 | 3500 | 3505 | 3625 | 3481 | | | |
| $P_1$ | 3395 | 3689 | 2965 | 3486 | 3237 | 3326 | 3125 | 3431 | 3493 | | | |
| $S_1$ | 3366 | 3542 | 3037 | 3874 | 3348 | 2723 | | | | | | |
| $S_2$ | 3422 | 4077 | 3084 | 3661 | 3274 | 3649 | | | | | | |
| $S_3$ | 3892 | 3586 | 2982 | 3034 | 3560 | 3867 | | | | | | |
| $R_1$ | 3477 | 3837 | 3255 | | | | | | | | | |
| $R_2$ | 3311 | 3957 | 2913 | | | | | | | | | |
| $R_3$ | 3892 | 3411 | 2935 | | | | | | | | | |

C.D. for N or P marginal means =135·2 Kg/ha.
C.D. for N or P means at the same level of D or S =234·0 Kg/ha.
C.D. for D or S means at the same level of N or P=595·9 Kg/ha.

2. TREATMENTS :

10 insecticidal treatments : $T_1$=Control, $T_2$=Anthio –40·7 CC., $T_3$=Demecron E.C. 100 –3·4 CC., $T_4$= Demecron (wettable powder) 3 packets, $T_5$=Endrin 16·9 CC., $T_6$=Folidol 7·3 CC., $T_7$=Paramar 6·8 CC., $T_8$=Rogor 8·5 CC., $T_9$=Sevin 3 packets and $T_{10}$=Sumathion 6·8 CC.

All insecticides were dissolved in 6·8 litres of water. 2 sprayings of each insecticide on 24.11.1964 and 31.12.1964.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (ii) 3 (iv) (a) and (b) 7·6 m.×4·9 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) As per treatments. (iii) Grain and straw weight. (iv) (a) 1963—contd (modified in 1964). (b) No. (c) Nil. (v) to (vii) Nil.

3. RESULTS :

(i) 2648 Kg/ha. (ii) 247·8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ .

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 2448 | 2533 | 2725 | 2701 | 3044 | 2491 | 2500 | 2498 | 2766 | 2770 |

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**Crop :- Paddy (*Rabi*).** **Ref :- Ms. 65(34).**

**Site :- Agri. Res. Stn., Mangalore.** **Type :- 'D'.**

Object :— To study the effect of spraying different insecticides in controlling Paddy stem borer.

1. BASAL CONDITIONS :

(i) (a) Paddy after Paddy. (b) Paddy. (c) N.A. (ii) Sandy soil. (iii) 8.9.65/22.10.65. (iv) (a) 5 ploughings and puddling. (b) Transplanting. (c) 37 Kg/ha. (d) 20 cm.×20 cm. (e) 3. (v) N, P, and K @ 33·6 Kg/ha. each. (vi) MGL-7. (vii) Irrigated. (viii) Hand weeding. (ix) 44·7 cm. (x) 2.2.66.

2. TREATMENTS :

10 insecticidal treatments : $T_0$=Control, $T_1$=B.H.C. grannules (dust 7). $T_2$=Roger (spray) grannules, $T_3$= Endrin grannules. $T_4$=Heptachlose (spray) grannules, $T_5$=Folithion EC 0·05% 4·5 cc/4·5 liters of water, $T_6$=Tria-thion 11·3/4·5 liters of water, $T_7$=Dimecron 2·5/4·5 liters of water, $T_8$=Thiodon 0·15% 11·4/4·5 liters of water and $T_9$=Malathion 0·1% 9·0/4·5 liters of water.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 6·1 m.×6·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) As per treatments. (iii) Yield of grain. (iv) (a) 1963-66. (modified every year) (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2795 Kg/ha. (ii) 272·8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 2745 | 2807 | 2963 | 2734 | 2783 | 2828 | 2702 | 2727 | 3142 | 2520 |

**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 62(9), 63(6).**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'D'.**

Object :— To study the effect of Irradiation on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) G.M. (c) 22·4 Kg/ha. of $P_2O_5$. (ii) Sandy loam. (iii) 30.5.62/12.8.62 ; 29.5.63/1.7.63. (iv) (a) 4 to 5 ploughings. (b) Transplanting. (c) —. (d) 23 cm.×23 cm. (e) 1. (v) 33 6 Q/ha. of G.M.+33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super at transplanting and 33·6 Kg/ha. of N as top-dressing. (vi) S. 661 (late). (vii) Irrigated. (viii) 2 hand weedings. (ix) 48 cm. ; 37 cm. (x) 21.12.62 ; 11.12.63.

2. TREATMENTS :

5 radio irradiation treatments : $T_0$=Control, $T_1$=Intensity of $2{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 1 second, $T_2$=Intensity of $2{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 2 seconds, $T_3$=Intensity of $2{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 3 seconds and $T_4$=Intensity of $7{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 1 second.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 10·3 m.×1·8 m.; 8·7 m.×1·8 m. (b) 9·4 m.×0·9 m. ; 8·2 m.×1·4 m. (v) and (vii) Yes.

4. GENERAL :

(i) Good. (ii) Nil ; spraying of folidol was taken as a precautionary measure. (iii) Yield of grain. (iv) (a) 1962-63. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 1784 Kg/ha. (ii) 318·4 Kg/ha. (based on 28 d.f. made up of pooled error and Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Mean yield | 1625 | 1907 | 1650 | 1740 | 2000 |

| Years | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|
| 1962 | 682 | 1005 | 732 | 1150 | 1141 | * | 942 | 236·0 |
| 1963 | 2568 | 2809 | 2567 | 2331 | 2858 | N.S. | 2627 | 354·4 |
| Pooled | 1625 | 1907 | 1650 | 1740 | 2000 | N.S. | 1784 | 318·4 |

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**Caop :- Paddy (*Kharif*).** **Ref :- Ms. 62(10).**

**Site :- Agri. Res. Stn., Nagenhally.** **Type :- 'D'.**

Object :— To study the effect of irradiation on the variety S. 1092 of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-GM-Paddy. (b) G.M. (c) 22·4 Kg/ha. of $P_2O_5$ (ii) Sandy loam. (iii) 30.5.62/12.8.62, (iv) (a) 4 ploughings puddling. (b) Transplanting. (c) —. (d) 23 cm.×23 cm. (e) 1. (v) 33·6 Q/ha. of G.M.+33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super at transplanting and 33·6 Kg/ha. of N as A/S top-dressed. (vi) S. 1092. (vii) Irrigated. (viii) 2 hand weeding. (ix) 48 cm. (x) 21.12.62.

2. TREATMENTS :

8 radio irradiation treatments : $T_0$=Control (no irradiations), $T_1$=Intensity $5{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 1 sec., $T_2$=Intensity $5{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 2 sec., $T_3$=Intensity $7{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 0 (Instantaneous), $T_4$=Intensity $7{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 1 sec., $T_5$=Intensity $7{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 2 sec., $T_6$=Intensity $7{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 3 sec. and $T_7$=Intensity $7{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 4 sec.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 10·3 m.×1·8 m. (b) 9·4 m.×0·9 m. (v) 46 cm.×46 cm (vi) Yes.

4, GENERAL :

(i) Good. (ii) Nil, spraying of folidol was taken as a precautionary measure. (iii) Yield of grain. (iv) (a) 1962-63. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1413 Kg/ha. (ii) 471·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha,

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 1359 | 1570 | 1447 | 1785 | 1379 | 869 | 1402 | 1492 |

**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 63(5).**

**Site :- Agri. Res. Stn., Nagenhalli.** **Type :- 'D'.**

Object :— To study the effect of irradiation on paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-G.M.-Paddy. (b) G.M. (c) 22·4 Kg/ha. of $P_2O_5$ as Super. (ii) Red sandy loam. (iii) 29.5.63/ 1.7.63. (iv) (a) 5 ploughings. (b) Transplanting. (c) —. (d) 23 cm.×23 cm. (e) 1. (v) 33·6 Q/ha. of G.M.+33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super at planting. (vi) S. 1092. (vi) Irrigated. (viii) 2 hand weedings and passing Japanese paddy cultivator, (ix) 37 cm. (x) 11.12.63.

2. TREATMENTS :

9 radio irradiation treatments : $T_0$=Control (no irradiation), $T_1$=Intensity $2{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 1 sec., $T_2$=Intensity $2{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 2 sec., $T_2$=Intensity $7{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 0 (Instantaneous), $T_3$=$7{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 1 sec., $T_4$=Intensity $7{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 2sec., $T_5$= Intensity $7{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 3 sec., $T_6$=Intensity $7{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 4 sec. and $T_8$=Intensity $7{\cdot}5\times10^{12}$ NP/cm$^2$ exposed for 5 sec.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 8·7 m.×1·8 m. (b) 8·2 m.×1·4 m. (v) 23 cm.×23 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil ; Folidol was sprayed as a precautionary measure. (iii) Yield of grain. (iv) (a) 1962-63 (modified in 63). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2692 Kg/ha. (ii) 665·9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_0$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 3230 | 2865 | 2865 | 2755 | 2280 | 2500 | 2437 | 2936 | 2846 |

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**Crep :- Paddy (*Kharif*).** **Ref :- Ms. 65(11).**

**Site :- Agri. Res. Stn., Ponnempet.** **Type :- 'D'.**

Object :—To find out the efficacy of different fungicides in controlling blast disease on Paddy.

1. BASAL CONDITIONS :

(a) Paddy—Paddy. (b) Paddy. (c) F.Y.M. at 22·2 C.L./ha.+A/S at 168 Kg/ha.+Super at 224 Kg/ha.+18 Q/ha. of G.L. (ii) Sandy loam. (iii) 20.6.65/21.7.65. (iv) (a) 2 dry ploughings, 4 ploughings in puddle and the levelling. (b) Transplanting. (c) (d) 25 cm.×25 cm. (e) 3 to 4. (v) 168 Kg/ha. of A/S in two doses+224 Kg/ha. of Super. (vi) K.B. 356 (late). (vii) Unirrigated. (viii) 2 hand weedings. (ix) 149·4 cm. (x) 29.12.65.

2. TREATMENTS :

5 fungicidal treatments :

$T_0$=Control, $T_1$=Bordeaux, $T_2$=Mercury dust, $T_3$=Sulphur, and $T_4$=Blotox. Spraying murcury once, dropping seedlings in treatments before planting, 3 times spraying in the vegetative stages in the fields and spraying twice after reading stage with different treatments.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 19 m.×7 m. (iii) 5. (iv) (a) 4 m.×7 m. (b) 3 m.×6 m. (v) and (vi) Yes.

4. GENERAL :

(i) Slight lodging in all treatments. (ii) Sever blast disease, control measure as per treatments. (iii) Yield of grain. (iv) (a) 1965—N.A. (b) Yes. (c) Nil. (v) N.A. (vi) Nil. (vii) N.A.

5, RESULTS :

(i) 2701 Kg/ha. (ii) 1036 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. yield | 2073 | 2518 | 2610 | 3483 | 2820 |

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**Crop :- Paddy (*Kharif*).** **Ref :- Ms. 65(12).**

**Site :- Agri. Res. Stn., Ponnempet.** **Type :- 'D'.**

Object :—To study the efficacy of different fungicides and antibiotics in controlling blast disease.

1. BASAL CONDITIONS :

(i) (a) Paddy—Paddy. (b) Paddy. (c) F.Y.M. at 22·2 C.L./ha.+168 Kg/ha. of A/S in 2 doses+22·2 Kg/ha. Super in one dose+G.L. at 28 Q/ha. (ii) Sandy loam. (iii) 19.7.95/6.9.65. (iv) (a) 2 dry ploughings, 4 ploughings in puddle and levelling. (b) Transplanting. (c) —. (d) 25 cm.×25 cm. (e) 3 to 4. (v) 22·2 CL/ha. of F.Y.M.+A/S at 168 Kg/ha.+Super at 224 Kg/ha. (vi) P—S | 1 (medium late). (vii) Unirrigated. (viii) 2 hand weedings. (ix) 169·4 cm. (x) 10.1.66.

2. TREATMENTS :

6 fungicidal treatments : $T_0$=Control, $T_1$=Blas, $T_2$=Knickel Chloride, $T_3$=Mercury Copper, $T_4$=Kasumin, and $T_5$=Breston.

3 sprays in the field in vegetative stage and twice after heading stage.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 41 m.×6 m. (iii) 4. (iv) (a) 7 m.×6 m. (b) 6 m.×5 m. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) The crop was heavily affected with stem borer and chaffy earheads and slight neck infection. (iij) Yield of grain. (tv) (a) 1965—N.A. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Nil.

5. RESULTS :

(i) 1485 Kg/ha. (ii) 341 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1266 | 1447 | 1577 | 1635 | 1587 | 1400 |

* * *

**Crop :- Paddy (*Kharif*).** **e f :- Ms. 62(11), 63(31), 64(10).**

**Site :- Agri. Res. stn., Nagenhally.** **Type :- 'D.'**

Object :—To control seed infection by chemical means and to study its effect on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) G.M.—Paddy. (b) G.M. (c) 22·5 Kg/ha. of $P_2O_5$ as Super. (ii) Red sandy loam. (iii) 31.5.62/6.7.62 ; 29.5.36/28.6.63 ; 6.6.64/13.7.64. [iv) (a) 3 to 5 ploughings. (b) Transplanting. (c) —. (d) 23 cm. ×23 cm. ; 25 cm.×23 cm. for 63 and 64. (e) 2 to 3 ; N.A. (v) 56 Q to 67 Q/ha. of G.M.+33·6 Kg/ha. of N as A/S for 62(11) 56 Q/ha. of G.M.+22·4 Kg/ha. of N as A/S for 63(31) and 56 Q/ha. of G.M.+22·4 Kg/ha. of N.+22·4 Kg/ha. of $P_2O_5$+11·2 Kg/ha. of N top dressed for 64(10). (vi) C.H—2 ; CL—2 (early) ; S.10 92. (vii) Irrigated. (viii) As per treatments. (ix) 11 cm. ; 17 cm. ; 57 cm. (x) 1.10.62 ; 8.10.63 ; 17 and 18.12.64.

2. TREATMENTS :

$T_1$=Usual method (passing the Japaneese weeder and hand weeding. Jap weeder once in 15 days. Hand weeding 30 days after), $T_3$=Spraying 2—4—D [2·2 Kg in 562 litres/ha. of water 5 and 30 days after planting], $T_3$=Spraying as well as interculturing, $T_4$=Spraying as well as interculturing and hand weeding and $T_5$=Spraying 2—4—D and irrigation once in 5 days, but 25 days after Ist spraying.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 8·0 m.×8·0 m ; 12·3 m.×9·1 m. ; 7·8 m.×11·9 m. (b) 7·1 m.×7·1 m ; 9·3 m.×8·2 m. ; 6·9 m.×10·0 m. (v) 46 cm.×46 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Mlid attack of stem borer; sever rat and bird damage; Nil. (ili) Yield of grain. (iv) (a) 1962 to 64. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent, results of the individual experiments are presented below.

5. RESULTS :

62(11)

(i) 1529 Kg/ha. (ii) 309·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Trratment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. yield | 1632 | 1712 | 1708 | 1381 | 1213 |

63(31)

(i) 2170 Kg/ha. (ii) 645·9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. yield | 2638 | 2357 | 2342 | 2312 | 1201 |

64 10)

(i) 3885 Kg/ha. (ii) 579·2 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. yield | 3206 | 4136 | 4036 | 4601 | 3447 |

C.D.=892·6 Kg/ha.

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**Crop :- Wheat. (*Rabi*).** **Ref :- Ms. 60(82), 61(44),62(32), 63(20).**

**Site :- Agri. Res. Stn., Bailhongal.** **Type :- 'M'.**

Object :—To find out the optimum requirement of N, P and K for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) China-Mug ; Gram and Groundnut ; Jowar for 62(32) and 63(20). (c) 12·4 C.L./ha. of F.Y.M. (ii) Black soil, (ii) 22.10.60 ; 4.11.61 ; 20.10.62 ; 19.10.63. (iv (a) 1 ploughing, 3 to 4 harrowings. (b) Drilling. (c) 45 Kg/ha. (d) 30 cm.×15 cm. (e) N.A. (v) 12·4 C.L/ha. of F.Y.M. (vi) Kenphad. (vii) Unirrigated. (viii) 2—3 weedings, 1—2 interculturings. (ix) 81 cm.; N.A. ; 20 cm. : 2 cm. (x) 2.2.61 ; 10.2.62 ; 22.1.63 ; 19.1.64.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : $N_0$=0, $N_1$=11·2 and $N_2$=22·4 Kg/ha.

(2) 3 levels of $P_2O_5$ as Super : $P_0$=0, $P_1$=56·0 and $P_2$=112·1 Kg/ha.

(3) 3 levsls of $K_2O$ as Pot. Sul. : $K_0$=0, $K_1$=12·1 and $K_2$=224·2 Kg/ha.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 7·3 m.×4·9 m. (b) 6·1m.×4·3 m. (v) 61 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tiller counts, height of plants, yield of grain. (iv) (a) 1960 to 1963. (b) No. (c) Nil. (v) Bijapur ; Annegiri and Dharwar. (vi) Nil. (uii) Error variances are heterogeneous and (NP) ×years and (NK)×years interactions are present.

5. RESULTS :

(i) 847 Kg/ha. (ii) 210·0 Kg/ha. [based on 42 d.f. made up of (N, P, K, N×P and N×K)×years interactions]. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

|  | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 825 | 862 | 828 | 791 | 823 | 901 | 838 |
| $N_1$ | 824 | 895 | 835 | 830 | 839 | 884 | 851 |
| $N_2$ | 835 | 811 | 909 | 840 | 887 | 828 | 852 |
| Mean | 828 | 856 | 857 | 820 | 850 | 871 | 847 |

| Years | $N_0$ | $N_1$ | $N_2$ | Sig. | $P_0$ | $P_1$ | $P_2$ | Sig. | $K_0$ | $K_1$ | $K_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 692 | 681 | 821 | ** | 708 | 746 | 740 | N.S. | 737 | 732 | 724 | N.S. | 731 | 105·8 |
| 1961 | 1003 | 1047 | 849 | | 936 | 975 | 988 | N.S. | 946 | 980 | 973 | N.S. | 966 | 146·2 |
| 1962 | 1290 | 1278 | 1284 | N.S. | 1288 | 1288 | 1276 | N.S. | 1227 | 1267 | 1358 | N.S. | 1284 | 193·2 |
| 1963 | 368 | 399 | 454 | * | 380 | 415 | 426 | N.S. | 373 | 419 | 429 | N.S. | 407 | 89·8 |
| Pooled | 838 | 851 | 852 | N.S. | 828 | 856 | 857 | N.S. | 820 | 850 | 871 | N.S. | 847 | 210 0 |

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**Crop :- Wheat.**

**Site :- Agri. Res. Stn., Bijapur.**

**Ref :- Ms. 64(202), 65(73).**

**Type :- 'M'.**

Object:—To find out the suitable time of applications of fertilizers to Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Black soil. (iii) 19.10.1964 ; N.A. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) 45 Kg/ha. (d) 23 cm.×46 cm. (e) 2 to 3 thinned to one. (v) 12·4 C.L/ha. of F.Y. M. (vi) Kemphad. (vii) Unirrgated. (viii) Weeding and interculturing (ix) 1·2 cm ; 6·6 cm. (x) 20 2.65 ; 19.2.66

2. TREATMENTS :

4 manurial treatments : $T_0$= No fertiliser, $T_1$=16·8 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$ at planting; $T_2$= 16·8 Kg/ha. of N at planting+11·2 Kg/ha. of $P_2O_5$ 15 days after planting. and $T_4$= 16·8 Kg/ha. of N at planting.

3. DESIGN :

(i) R.B.D. (ii) 4 (b) 19·5 m .×9.1.(iii) 4; 6. (iv) (a) 10 7 m.×4. 9 m. ; 4·9 m.×9·1 m. (b)9·1 m.×3·7 m. ; 4.3 m. ×7.9m. (iv) and (v) Yes,

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964—1967. (b) No. (c) Nil. (v) Nil. (vi) and (vii) N.A.

5. RESULTS :

64 (202)

(i) 963 Kg/ha. (ii) 171.9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av. yield | 906 | 1008 | 1085 | 854 |

65(73)

(i) 339 Kg/ha. (ii) 67.2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av yield | 333 | 331 | 359 | 334 |

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**Crop :- Wheat** (*Rabi*). **Ref:- Ms. 62(281), 63(248), 64(199).**

**Site :- Agri. Res. Stn., Bijapur.** **Type :- 'M'.**

Object :— To find out the best method of application of fertilisers to obtain maximum yield.

1. BASAL CONDITIONS :

(i) Nil. (b) Wheat. (c) N.A. (ii) Black soil. (iii) 12.10.62 ; 1.11.63 ; 20.10.64. (iv) (a) 1 ploughing and 3 to 4 harrowings. (b) Drilling. (c) 45 Kg/ha. (d) 30·5 cm. between lines. (e) N.A. (v) Nil. (vi) Biraga Red (medium). (vii) Unirrigated. (viii) Hand interculturing. (ix) 42 cm. ; 21·7 cm. ; 12·4 cm. (x) 21.2.63 ; 21.2.64 ; 20.2.65.

2. TREATMENTS :

6 methods of application of N : $T_1$=Sowing by seed drill (control-no manure), $T_2$=16.8 Kg/ha. of N as A/S by seed cum fertilizer drill, $T_3$=Deep placement of fertilizer, 2/3 dose of 'N' by plough without mould board and ⅓N by spray (as Urea),$T_4$=2/3 dose of 'N' at sowing by seed cum fertilizer drill and ⅓ dose of N by spraying. $T_5$=⅓ dose of N at sowing by seed cum fertilizer drill and 2/3 dose by spray, $T_6$=Full dose (i.e.16.8 Kg/ha.) N by wooden plough at 10.2 cm. depth.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 27·4 m.×9·1 m. (iii) 4. (iv) (a) 9·1 m.×4·9 m. (b) 7·3 m.×3·7 m. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1962—1964. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent.

5. RESULTS :

62 (281)

(i) 916 Kg/ha. (ii) 139.1 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of wheat in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av yield | 587 | 1039 | 972 | 949 | 864 | 1083 |

C. D.=209·6 Kg/ha.

63 (248)

(i) 557 Kg/ha. (ii) 154.9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of wheat in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 528 | 631 | 471 | 597 | 590 | 519 |

64(119)

(i) 830 Kg/ha. (ii) 61·7 Kg/ha. (iii) Treatment difference are significant. (iv) Av yield of wheat in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av yield | 703 | 889 | 816 | 868 | 846 | 858 |

C.D.=92.9 Kg/ha.

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**Crop :- Wheat (*Rabi*).** **Ref :- Ms. 60(286).**

**Site :- Agri. Res. Stn., Bijapur.** **Type :- 'M'.**

Object :— To judge the effect of fertilizers on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) 9·1 C.L./ha. of F.Y.M. (ii) Black soil. (iii) 10.10.60. (iv) (a) Ploughing and harrowing. (b) By fertilizer cum seed drill. (c) 45 Kg/ha. (d) 30 cm. (e) N.A. (v) Nil. (vi) Kemphad. (vii) Unirrigated. (viii) Interculturing. (ix) 65 cm. (x) 21.2.61.

2. TREATMENTS :

3 manurial treatments : $T_0$=Control, $T_1$=16 Kg/ha. of N and $T_2=T_1+7·5$ Kg/ha. of $P_2O_5$ as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 2. (iv) (a) 12·2 m.×8·5 m. (b) 10·4 m.×6·7 m. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958-60. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 766 Kg/ha. (ii) 81·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|
| Av. yield | 679 | 803 | 816 |

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**Crop :- Wheat.** **Ref :- Ms. 62(278), 63(246).**

**Site :- Agri. Res. Stn., Bijapur.** **Type :- 'M'.**

Object :— To judge the effect of sunnhemp green manure on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) F.Y.M. 12·4 C.L./ha. (ii) Black soil. (iii) 7.10.62 ; 1.7.63. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 45 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) Kemphad. (vii) Unirrigated. (viii) Hand weeding and interculturing. (ix) 42 cm. ; 22 cm. (x) 19.2.63 ; 19.2.64.

2. TREATMENTS :

10 manurial treatments : $T_0$=Control, $T_1$=11·2 Kg/ha. of $P_2O_5$+13·4 Kg/ha. of N at sowing, $T_2$=Grow sunnhamp applying 11·2 Kg/ha. $P_2O_5$ and harrow after one month, $T_3$=Grow sunnhemp applying 11·2 Kg/ha $P_2O_5$ and bury sunnhemp with plough after one month, $T_4$=Grow sunnhemp applying 11·2 Kg/ha. $P_2O_5$ and harrow 1½ month after sowing, $T_5$=Grow sunnhemp applying 11·2 Kg/ha. $P_2O_5$ and bury 1½ month after sowing, $T_6$=Grow sunnhemp applying 11·2 Kg/ha. $P_2O_5$ and cut saun 1½ months after but use above ground portion for composting else where, $T_7$=Grow sunnhemp appling 11·2 Kg/ha. $P_2O_5$ and bury it after 2 months, $T_8$=Grow sunnhemp applying 11·2 Kg/ha. $P_2O_5$ and cut saun after 2 months but use above ground portion to compost else where and $T_9$=Green sunnhemp with 13·4 Kg N while sowing and bury after 1½ months.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) 18·3 m.×18·3 m. (iii) 4. (iv) (a) 9·1 m.×3·7 m. (b) 7·3 m.×2·4 m. (v) 91 cm.×61 cm. (vi) Yes.

4. GENERAL :

(i)Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962-63. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is present.

5. RESULTS :

(i) 493 Kg/ha. (ii) 178·5 Kg/ha. (based on 9 d.f. made up of Treatments×years interaction. (iii) Treatment differences art not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 404 | 555 | 537 | 685 | 414 | 505 | 469 | 467 | 361 | 536 |

| r | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | 422 | 678 | 652 | 898 | 438 | 588 | 521 | 564 | 364 | 582 | * | 571 | 117 4 |
| 1963 | 385 | 432 | 421 | 472 | 390 | 423 | 418 | 371 | 358 | 490 | N.S. | 416 | 56·7 |
| Pooled | 404 | 555 | 537 | 685 | 414 | 505 | 469 | 467 | 361 | 536 | N.S. | 493 | 178·5 |

**Crop :- Wheat** (*Rabi*). **Ref :- Ms. 60(128), 61(119).**

**Site :- Agri. Res. Stn., Bijapur.** **Type :- 'M'.**

Object :— To study the effect of different nitrogenous fertilizers on Wheat.

1. BASAL CONDITIONS :

(i) (a) N.A. ; Wheat-*Jowar*. (b) Wheat ; *Jowar*. (c) 9·9 C.L /ha. of F.Y.M. ; 12·3 C.L./ha. of F.Y.M. (ii) Black. (iii) 12.10.60 ; 21.10.61. (iv) (a) Ploughing, clod crushing and 2 harrowings for 60(128), 4 harrowings for 61(119). (b) Drilling. (c) 45 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) Kemphad (medium). (vii) Unirrigated. (viii) Interculturing and weeding. (ix) 65 cm. ; 5 cm. (x) 22.2.61 ; 2.2.62.

2. TREATMENTS :

All combinations of (1) and (2) with a control (5 plots per replication).
(1) 2 levels of N : $N_1$=16·8 and $N_2$=33·6 Kg/ha.
(2) 5 sources of N : $S_1$=A/S, $S_2$=Urea, $S_3$=A/S/N, $S_4$=C/A/N and $S_5$=Calcium Amm. Chloride.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 15. (b) 18·3 m.×16·5 m. (iii) 3. (iv) (a) 5·5 m.×3·7 m. (b) 4·6 m.×3·1m. (v) 46 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Normal lodging during January 1961. (ii) Nil. (iii) Ht. of Plants and grain yield. (iv) (a) 1960-61. (b) No. (c) Refer 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments× years interaction is absent.

5. RESULTS :

(i) 551 Kg/ha. (ii) 94·2 Kg/ha. (based on 73 d.f. made up of pooled error and Treatments×years interaction). (iii) Interaction N×S is significant. Control vs. others is significant. (iv) Av. yield of grain in Kg/ha.

Control=538 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | Mean |
|---|---|---|---|---|---|---|
| $N_1$ | 637 | 529 | 508 | 522 | 505 | 540 |
| $N_2$ | 529 | 559 | 546 | 630 | 610 | 575 |
| Mean | 583 | 544 | 527 | 576 | 557 | 557 |

C.D. for body of N×S table=108·6 Kg/ha.
C.D. for control vs. others=42·0 Kg/ha.

| Years | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | Sig | $N_1$ | $N_2$ | Sig. |
|---|---|---|---|---|---|---|---|---|---|
| 1960 | 786 | 763 | 750 | 766 | 756 | N.S. | 744 | 784 | N.S |
| 1961 | 380 | 325 | 305 | 387 | 359 | N.S. | 336 | 366 | N.S. |
| Pooled | 583 | 544 | 527 | 576 | 557 | N.S. | 540 | 575 | N-S. |

| Control | Sig. | G.M. | S.E./plot |
|---|---|---|---|
| 759 | N.S. | 762 | 96·4 |
| 316 | N.S. | 339 | 102·0 |
| 538 | * | 551 | 94·2 |

**Crop :- Wheat.** **Ref :- Ms. 60(270), 61(266).**
**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'M'.**

Object :— To study the effect of manures on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Black soil. (iii) 16.10.60 ; 17.10.61. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 45 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) Kemphad. (vii) Unirrigated. (viii) Weeding and intercultivation. (ix) 6·1 cm. ; 7·8 cm. (v) 26.1.61 ; N.A.

2. TREATMENTS

5 manurial treatments : $T_0$=Control (no manure), $T_1$=12·4 C.L./ha. of F.Y.M., $T_2$=22·4 Kg/ha. of N as A/S, $T_3$=16·8 Kg/ha. of $P_2O_5$ as Super and $T_4=T_2+T_3$.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 8·5 m.×8·5 m. (b) 7·3 m.×7·3 m. (v) 61 cm.×61 cm. (vi) Yes.

4. GFNERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960-61. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent.

5. RESULTS :

**60(270)**

(i) 1066 Kg/ha. (ii) 110·0 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. yield | 944 | 1060 | 1194 | 951 | 1180 |

C.D.=169·5 Kg/ha.

**61(266)**

(i) 1335 Kg/ha. (ii) 38·2 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. yield | 1288 | 1294 | 1371 | 1297 | 1426 |

C.D.=58·9 Kg/ha.

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**Crop :- Wheat (*Rabi*).** **Ref :- Ms. 64(88)**

**Site :- Agri. College, Dharwar.** **Type :- 'M'**

Object :- To find out suitable fertilizers placement method and kind of fertilizer for application to Wheat in black soil.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Black Soil. (iii) 1.11.64. (iv) (a) Grabling and harrowing. (b) Drilling. (c) 45 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) N.A. (vi) kemphad (vii) Unirrigated. (viii) Weeding. (ix) 5 cm. (x)12.2.65.

2. TREATMEMTS :

All combinations of (1) and (2) with 24·7 kg. of $P_2O_5$ as super+one control

(1) 4 sources of N at 32.1 Kg/ha. : $S_1$=A/S, $S_2$=Urea, $S_3$=C/A/N and $S_4$=A/S/N.

(2) 4 methods of application : $M_1$=By plough sole 13 cm. deep a week before sowing $M_2$=By seed cum-fertilizer drill at sowing, $M_3=P_2O_5$ by Plough sole and N by seed-cum-fertilizer drill and $M_4$=Fertilizer in seed drill and seeds through the draw tubes behind the plough.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 17. (b) N.A. (iii) 4. (iv) (a) 7·3 m.×6·1 m. (b) 6·1 m.×4·9 m. (v) 61 cm. × 61 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) yield of grain and straw. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 445 Kg/ha. (ii) 40·4 Kg/ha. (iii) Main effects of S and M and S×M interaction are highly significant. Control Vs others is significant. (iv) Av. yield of grain in Kg/ha.

Control=357 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $S_1$ | 845 | 385 | 355 | 387 | 493 |
| $S_2$ | 604 | 352 | 367 | 704 | 507 |
| $S_3$ | 357 | 362 | 373 | 359 | 363 |
| $S_4$ | 363 | 364 | 356 | 680 | 441 |
| Mean | 542 | 365 | 363 | 532 | 451 |

C.D. for S or M marginal means=28·7 Kg/ha.
C D. for body of table =57·7 Kg/ha.
C.D. for Control vs others =41.9 Kg/ha.

* * *

**Crop: - Wheat.** **Ref. :- Ms. 62(83), 63(83).**
**Site:- Agri. Res. Stn., Dharwar.** **Type 'M'.**

Object :— To study the N, P, K requirement of Wheat.

1. BASAL CONDITIONS :

(i) (a) Groundnut—Wheat. (b) Groundnut. (c) 12·4 C.L./ha. of F.Y.M. (ii) Medium black. (iii) 26.10.62 ; 25.10.63. (iv) (a) Harrowing. (b) Drilling. (c) 45 kg/ha. (d) 30 cm.×15 cm. (e) 1. (v) Nil. (vi) Amrut (Early). (vii) Unirrigated. (viii) Nil. (ix) 27 cm. ; 14 cm. (x) 3.2.63 ; 28.1.64.

2. TREATMENTS :

All combinations of (1) , (2) and (3)
(1) 2 levels of N as A/S : $N_0=0$ and $N_1=22{\cdot}4$ Kg/ha.
(2) 2 levels of $P_2O_5$ as super: $P_0=0$ and $P_1=11{\cdot}2$ Kg/ha.
(3) 2 levels of $K_2O$ as Mur. Pot. : $K_0=0$ and $K_1=11{\cdot}2$ Kg/ha.

3. DESIGN :

(i) $2^3$ Fact. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 7·3 m.×6·7 m. (b) 6·7 m.×6·1 m. (v) 30 cm. ×30 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962—63. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent.

5. RESULTS :

62(83)

(i) 1380 Kg/ha. (ii) 109·6 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $K_0$ | $K_1$ | Mean |
|---|---|---|---|---|---|
| $N_0$ | 1345 | 1320 | 1314 | 1351 | 1333 |
| $N_1$ | 1378 | 1477 | 1438 | 1417 | 1428 |
| Mean | 1362 | 1399 | 1376 | 1384 | 1380 |
| $K_0$ | 1303 | 1449 | | | |
| $K_1$ | 1421 | 1348 | | | |

C.D. for N marginal means=80·6 Kg/ha.

63(83)

(i) 261 Kg/ha. (ii) 62·4 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $K_0$ | $K_1$ | Mean |
|---|---|---|---|---|---|
| $N_0$ | 236 | 225 | 259 | 203 | 231 |
| $N_1$ | 270 | 314 | 304 | 280 | 292 |
| Mean | 253 | 269 | 281 | 241 | 261 |
| $K_0$ | 270 | 292 | | | |
| $K_1$ | 236 | 247 | | | |

C.D. for N marginal means=45·8 Kg.ha.

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**Crop :- Wheat (*Rabi*).** **Ref :- Ms. 61(114), 62(65), 63(65).**

**Site :- Agri. College Farm, Dharwar.** **Type :- 'M'.**

Object :— To find out a suitable placement method of fertilizers to Wheat in black soil.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Nil ; Groundnut ; Chilly and Cotton mixture. (c) N.A. ; N.A. ; 19·8 C.L./ha. of F.Y.M. (ii) Black soil, (iii) 13.10.61 ; 5.11.62 ; 2.11.63. (iv) (a) Ploughing and harrowing. (b) to (e) N.A. (v) Nil. (vi) Kemphad. (vii) Unirrigated. (viii) Weeding and interculturing. (ix) N.A. ; 4 cm. ; N.A. (x) 24.1.62 ; 25.2.63 ; February 1964.

2. TREATMENS :

All combinations of (1) and (2)+control.

(1) 2 manurial treatments : $T_1$=33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super and $T_2$=50-4 Kg/ha. of N as A/S+33·6 Kg/ha. of $P_2O_5$ as Super.

(2) 5 methods of placement : $M_1$=By plough sole method, $M_2$=Drilled both ways 30 cm. apart before sowing, $M_3$=By draw tube 3 cm. below the seed, $M_4$=By seed cum fertilizer drill along with the seed in the same line and $M_5$=5 cm. away and 5 cm. deep placement at fertilizers from the seed line.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×6·1 m. (b) 8·5 m.×5·5 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1961-63. (b) No. (c) Pooled results given under 5. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is present.

5. RESULTS :

(i) 709 Kg/ha. (ii) 195·1 Kg/ha. (based on 20 d.f. made up of Treatments×years interaction). (iii) Control vs. others is significant. (iv) Av. yield of grain in Kg/ha.

Control = 543 Kg/ha

| | $M_1$ | 2 | $M_3$ | $M_4$ | $M_5$ | Mean |
|---|---|---|---|---|---|---|
| $T_1$ | 772 | 695 | 719 | 707 | 653 | 709 |
| $T_2$ | 886 | 691 | 739 | 725 | 665 | 741 |
| | 829 | 693 | 729 | 716 | 659 | 725 |

C.D. for control vs. others=121·1 Kg/ha.

| Years | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | Sig. | $T_1$ | $T_2$ | Sig. | G.M. | S.E /plot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1961 | 750 | 696 | 733 | 730 | 586 | ** | 706 | 691 | N.S | 688 | 114·4 |
| | 1500 | 1176 | 1226 | 1239 | 1173 | ** | 1226 | 1300 | ** | 1226 | 70·6 |
| | 235 | 208 | 228 | 179 | 217 | * | 194 | 232 | ** | 212 | 33·3 |
| Pooled | 829 | 693 | 729 | 716 | 659 | N.S. | 709 | 741 | N.S. | 709 | 195·1 |

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**Crop :- Wheat (*Rabi*).** **Ref :- Ms. 60(83), 61(50).**

**Site :- Agri. Res. Stn., Gangavathy.** **Type :- 'M'.**

Object :— To find out a proper manurial schedule for wheat with newly localised T.B.P area where the soil is of very poor fertility.

## 1. BASAL CONDITIONS :

(i) (a) Sugarcane-Wheat ; *Jowar*-Groundnut-Wheat. (b) Nil. ; groundnut. (c) Nil ; 140·1 Kg/ha. of super. (ii) Light black soil. (iii) 3.11.60 ; 3.11.61. (iv) (a) 2 ploughings and 4 harrowings. (b) Drilling. (c) 45 Kg/ha. (d) and (e) N.A. (v) 12·4 C.L./ha. of F.Y.M. (vi) K. 28. (vii) Irrigated. (viii) 2 weedings, 2 hoeings and 4 intercultivations for 60 (83) ; 2 hoeings and 1 weeding for 61 (50). (ix) N.A. ; Nil. (x) 11.2.61 ; 8.2.62.

## 2. TREATMENTS :

All combinations of (1), (2) and (3).

(1) 4 levels of N as A/S : $N_0$=0, $N_1$=33·6, $N_2$=44·8 and $N_3$=56·0 Kg/ha.
(2) 4 levels of $P_2O_5$ as Super : $P_0$=0, $P_1$=22·4, $P_2$=33·6 and $P_3$=44·8 Kg/ha.
(3) 4 levels of $K_2O$ as Mur. Pot. : $K_0$=0, $K_1$=33·8, $K_2$=44·8 and $K_3$=56·0 Kg/ha.

## 3. DESIGN :

(i) $4^3$ fact. in R.B.D. (ii) (a) 64. (b) N.A. (iii) 3. (iv) (a) 5·5 m.×3·7 m. (b) 4·3 m.×2·4 m. (v) 61 cm. ×61 cm. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1959-61. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent.

## 5. RESULTS :

**60(83)**

(i) 1742 Kg/ha. (ii) 391·9 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $P_3$ | $K_0$ | $K_1$ | $K_2$ | $K_3$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $N_0$ | 1356 | 1293 | 1455 | 1503 | 1563 | 1323 | 1534 | 1187 | 1402 |
| $N_1$ | 1666 | 1823 | 2152 | 2041 | 1909 | 1989 | 1891 | 1893 | 1921 |
| $N_2$ | 1723 | 1604 | 1687 | 1901 | 1771 | 1557 | 1820 | 1767 | 1729 |
| $N_3$ | 1925 | 2099 | 1769 | 1879 | 1877 | 1823 | 2143 | 1829 | 1918 |
| Mean | 1668 | 1705 | 1766 | 1831 | 1780 | 1673 | 1847 | 1669 | 1742 |
| $K_0$ | 1754 | 1863 | 1687 | 1816 | | | | | |
| $K_1$ | 1698 | 1632 | 1642 | 1720 | | | | | |
| $K_2$ | 1620 | 1670 | 2037 | 2061 | | | | | |
| $K_3$ | 1598 | 1654 | 1697 | 1727 | | | | | |

C.D. for N marginal means=158·4 Kg/ha.

**61(50)**

(i) 595 Kg/ha. (ii) 223·2 Kg/ha. (iii) The main effects of N and P ars highly significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $P_3$ | $K_0$ | $K_1$ | $K_2$ | $K_3$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $N_0$ | 504 | 478 | 586 | 546 | 475 | 558 | 518 | 563 | 528 |
| $N_1$ | 442 | 412 | 600 | 652 | 440 | 522 | 506 | 638 | 527 |
| $N_2$ | 553 | 437 | 624 | 659 | 565 | 600 | 510 | 598 | 568 |
| $N_3$ | 741 | 749 | 732 | 810 | 741 | 774 | 740 | 777 | 758 |
| Mean | 560 | 519 | 635 | 667 | 555 | 614 | 569 | 644 | 595 |
| $K_0$ | 541 | 454 | 525 | 701 | | | | | |
| $K_1$ | 534 | 558 | 701 | 661 | | | | | |
| $K_2$ | 515 | 492 | 671 | 596 | | | | | |
| $K_3$ | 650 | 572 | 645 | 709 | | | | | |

C.D. for N or P marginal means=90·1 Kg/ha.

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**Crop :- Wheat.** **Ref :- Ms. 61(136), 62(123), 63(106).**

**Site :- Agri. Res. Stn., Naragund.** **Type :- 'M'.**

Object :— To find out the utility of C/A/N on alkali soils.

I. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton ; Wheat ; Wheat. (c) 12·4 C.L./ha. of F.Y.M. ; N.A. ; N.A. (ii) Alkali soils. (iii) 19.10.61 ; 26.10.62 ; 10.11.63. (iv) (a) Harrowing by blade harrow. (b) and (c) N.A. (d) 46 cm. between rows. (e) N.A. (v) Nil. (vi) Khempad. (vii) Unirrigated. (viii) Nil. (ix) 49 cm. ; 82 cm. in the whole year ; 58 cm. in the whole year. (x) 19.1.62 : 7.2.63 ; 11.2.64.

2. TREATMENTS :

3 manurial treatments : $M_0$=Control (No manure), $M_1$=16·8 Kg/ha, of N as C/A/N and $M_2$=16·8 Kg/ha. of N as A/S.

3. DESIGN :

(i) R B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 5·5 m. × 5·9 m. (b) 5·0 m. × 5·0 m. (v) 46 cm. × 46 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961-63. (b) No. (c) Results of combined analysis given under 5. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

5. RESULTS :

(i) 377 Kg/ha. (ii) 95·4 Kg/ha. (based on 46 d.f. made up of Treatments × years interaction and pooled error. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ |
|---|---|---|---|
| Av. yield | 371 | 436 | 325 |

C.D.=55·6 Kg/ha.

| Years | $M_0$ | $M_1$ | $M_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|
| 1961 | 225 | 225 | 181 | N.S. | 210 | 74·6 |
| 1962 | 546 | 677 | 476 | * | 566 | 124·8 |
| 1963 | 341 | 406 | 318 | N.S. | 355 | 78·4 |
| Pooled | 371 | 436 | 325 | ** | 377 | 95·4 |

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**Crop :- Wheat (*Rabi*).** **Ref :- Ms. 60(148), 61(139), 62(124), 63(114), 64(116), 65(101).**

**Site :- Agri. Res. Stn., Naragund. Type :- 'M'.**

Object :— To find out a suitable time and method of application of sulphur to Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton for 60 (148) ; Wheat for other years. (c) N.A. for 60(148) ; 62·8 Q/ha. of F.Y.M. +125·5 Kg/ha. of sulphur for 61(139), Nil for other years. (ii) Alkaline soil. (iii) 13.10.60 ; 19.10 61 ; 20.10.62 ; 2.11.63 ; 3.11.64 ; 31.10.65. (iv) (a) Harrowing by blade harrow. (b) Drilling. (c) 45 Kg/ha. (d) 36 cm. between rows. (e) N.A. (v) 12·4 C.L./ha. of F.Y.M. by broadcast for 60(148) ; 62 8 Q/ha. of F.Y.M. for 61(139) ; Nil for other years. (vi) Kenphad for 60 to 63, Amrut for 64 and 65. (vii) Unirrigated. (viii) Nil. (ix) 56 cm. in the whole year ; 49 cm. ; 82 cm. in the whole year ; 58 cm. in the whole year ; 108 cm. ; 36·8 cm. (x) 10.1.61 ; 16.1.62 ; 7.2.63 ; 5.2.64 ; 14.2.65 ; 27.2.66.

2. TREATMENTS:

**Main-plot treatments :**

2 times of application of Sulphur : $T_1$=15th July and $T_2$=15th August.

**Sub-plot treatments :**

4 methdos of application of Sulphur : $M_1$=Broadcasting and harrowing, $M_2$=Wooden Ploughing, $M_3$=Drilling and $M_4$=Furrowing.

Sulphur was applied at 125·5 Kg/ha.

### 3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 11·0 m. ×5·9 m. (b) 10·1 m.×5·0 m. (v) 46 cm.×46 cm. (vi) Yes.

### 4. GENERAL ;

(i) Shunted growth in 65(101) good for other years. (ii) Nil. (iii) Plant ht. and yield of grain. (iv) (a) 1960-contd. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Main-plot as well as sub-plot variances are hetrogeneous.

### 5. RESULTS :

**60(148)**

(i) 514 Kg/ha. (ii) (a) 102·1 Kg/ha. (b) 63·2 Kg/ha. (iii) Main effect of T alone is significant. (iv) Av. yield of grain in Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $T_1$ | 500 | 488 | 487 | 508 | 496 |
| $T_2$ | 595 | 537 | 482 | 518 | 533 |
| Mean | 547 | 512 | 485 | 513 | 514 |

C.D. for T marginal means=114·9 Kg/ha.

**61(139)**

(i) 217 Kg/ha. (ii) (a) 51·1 Kg/ha. (b) 79·2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $T_1$ | 200 | 180 | 250 | 171 | 200 |
| $T_2$ | 277 | 277 | 210 | 175 | 235 |
| Mean | 238 | 229 | 230 | 173 | 217 |

**62(124)**

(i) 599 Kg/ha. (ii) (a) 27·9 Kg/ha. (b) 69·3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $T_1$ | 568 | 584 | 602 | 595 | 587 |
| $T_2$ | 630 | 632 | 610 | 573 | 611 |
| Mean | 599 | 608 | 606 | 584 | 599 |

**63(114)**

(i) 369 Kg/ha. (ii) (a) 19·8 Kg/ha. (b) 58·3 Kg/ha. (iii) Main effect of T alone is significant. (iv) Av. yield of grain in Kg/ha.

|  | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $T_1$ | 322 | 375 | 400 | 323 | 355 |
| $T_2$ | 381 | 400 | 353 | 401 | 384 |
| Mean | 351 | 387 | 377 | 362 | 369 |

C.D. for T marginal means=22·3 Kg/ha.

**64(116)**

(i) 550 Kg/ha. (ii) (a) 102·8 Kg/ha. (b) 78·4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

|  | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $T_1$ | 498 | 589 | 532 | 616 | 559 |
| $T_2$ | 512 | 575 | 581 | 500 | 542 |
| Mean | 505 | 582 | 556 | 558 | 550 |

**65(101)**

(i) 1598 Kg/ha. (ii) (a) 192·1 Kg/ha. (b) 371·2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

|  | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $T_1$ | 1957 | 1206 | 1591 | 1344 | 1524 |
| $T_2$ | 1655 | 1690 | 1621 | 1724 | 1672 |
| Mean | 1806 | 1448 | 1606 | 1534 | 1598 |

**Crop :- Wheat** (*Rabi*).

**Site :- Agri. Res. Stn. , Naragund.**

**Ref :- Ms 63(112), 64(91).**

**Type :- 'M'.**

Object : - To find a suitable method of application of N and P fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Nil ; wheat. (c) Nil ; As per treatments. (ii) Alkaline. (iii) 2.11.63; 6.11.64. (iv) (a) Harrowing by blade harrow. (b) Drilling. (c) 45 Kg/ha (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) Amrut (early). (vii) Unirrigated. (viii) 1 to 2 hand weedings. (ix) 58 cm. in the whole year; 108 cm. in the whole year. (x) 9.2.64 ; 14.2.65.

2. TREATMENTS :

6 methods of application of 16.8 Kg./ha. of N+16.8 Kg./ha of $P_2O_5$ : $M_0$=Control (no manure), $M_1$= broadcasting, $M_2$=Deep placement : 2/3 dose behind the iron plough and ⅓ dose at sowing by usual method, $M_3$=Deep placement : 2/3 dose behind the plough and ⅓ dose as top dressing 2 to 3 weeks after germination of seeds $M_4$=2/3 dose by deep placement and ⅓ dose by spraying twice : 1st 20 days after germination and 2nd at flowering stage and $M_5$=⅓ dose by deep placement and 2/3 dose by spraying as in $M_4$.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 8·8 m.×7·6 m. (b) 7·3 m×6·1 m. (v) 76 cm.×76cm. (vi) Yes

4. GENERAL :

(i) Good. (ii) Nil. (iii) Plant height and grain yield. (iv) (a) 1963—64. (b) Yes. (c) Results of combined analysis given under 5Results. (v) Bijapur and Bagalkot. (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

5. RESULTS :

(i) 228 Kg./ha. (ii) 121·5 Kg./ha. (based on 35 d.f. made up of pooled error and Treatments × years interaction. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 144 | 350 | 258 | 226 | 206 | 182 |

C.D.=123·4 Kg.ha,

| Years | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|
| 1963 | 127 | 351 | 245 | 230 | 188 | 155 | N.S. | 216 | 158·7 |
| 1964 | 160 | 350 | 270 | 223 | 225 | 208 | N.S. | 239 | 94·3 |
| Pooled | 144 | 350 | 258 | 226 | 206 | 182 | * | 228 | 121·5 |

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**Crop :- Wheat** (*Rabi*). **Ref :- Ms 61(135), 62(120), 63(107),64(94).**

**Site :- Agri. Res. Stri., Naragund.** **Type :- 'M'.**

Cbject: — To study the effect of different chemicals in the Reclamation of Kari Soil.

1. BASAL CONDITIONS :

(i) No. (b) Cotton for 61(135), wheat for other years. (c) 12·4 C.L /ha. of F.Y.M. for 61(135) ; As per treatments for other years. (ii) Alkali soil. (iii) 5.11.61 ; 26.10.62 ; 2.11.63 ; 3.11.64. (iv) (a) Harrowing by blade harrow. (b) Broadcasting for 61(135) ; N.A. for 62 and 63. Drilling for 64(95). (c) 45 Kg/ha. for 64(94); N.A. for others. (d) 46 cm. between rows for 64(94) ; N.A. for others (e) N.A. (v) Nil. (vi) Amrut (early). (vii) Unirrigaated. (viii) Nil. (ix) 49 cm. ; 82 cm. in the whole year ; 58 cm. in the whole year ; 108 cm. inthe whole year. (x) 1.2.62 ; 1.2.63 ; 8.2.64.

2. TREATMENTS :

4 chemicals treatments : $T_0$=Control, $T_1$=44.8 Q/ha. of H $NO_3$, $T_2$=50·2 Q/ha of gypsum and $T_3$=12·6 Q/ha. of Sulphur.

3, DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) (iv) (a) 7·3 m.×4.3m. (b) 6·4 m×3·4 m. (v) 46 cm.×4 6m. (vi) Yes.

4. GENEAL :

(i) Normal. (ii) Nil. (iii) Ear head count ; plant height and grain yield. (iv) (a) 1961—1964. (b) Yes. (c) Pooled results are presented under 5 Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is present.

5. RESULTS :

(i) 450 Kg/ha. (ii) 225.6 Kg/ha. (based on 9 d.f. made up Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av. yield | 374 | 510 | 468 | 448 |

| | $T_0$ | $T_1$ | $T_2$ | $T_3$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|
| 1961 | 161 | 186 | 165 | 153 | N.S. | 166 | 36·1 |
| 1962 | 612 | 768 | 824 | 903 | * | 777 | 179·6 |
| 1963 | 292 | 392 | 359 | 267 | N.S. | 328 | 104·2 |
| 1964 | 433 | 692 | 522 | 469 | ** | 529 | 120·7 |
| Pooled | 374 | 510 | 468 | 448 | N.S. | 450 | 225·6 |

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**Crop :- Wheat (*Rabi*).** **Ref :- Ms. 63(105).**

**Site :- Agri. Res. Stn., Naragund.** **Type :- 'M'.**

Object :— To study the effect of different levels and sources of $P_2O_5$ on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Alkaline. (iii) 3.11.63. (iv) (a) Harrowing by blade harrow. (b) to (e) N.A. (v) 33·6 Kg/ha. of N. (vi) Amrut (early). (vii) Unirrigated. (viii) Nil. (ix) 58 cm. in whole year. (x) 11.2.64.

2. TREATMENTS :

All combinations of (1) and (2).
(1) 3 levels of Ammo. Phos. : $A_0=0$, $A_1=16·8$ and $A_2=33·6$ Kg/ha.
(2) 3 levels of Super : $B_0=0$, $B_1=16·8$ and $B_2=33·6$ Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 5·9 m.×5·9 m. (b) 5·0 m.×5·0 m. (v) 46 cm.× 46 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Plant count, height and grain yield. (iv) (a) 1963-contd. (modified in 1964). (b) No. (c) Nil. (v) Bagalkot and Bijapur. (vi) and (vii) Nil.

5. RESULTS :

(i) 374 Kg/ha. (ii) 74·6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $A_0$ | $A_1$ | $A_2$ | Mean |
|---|---|---|---|---|
| $B_0$ | 445 | 383 | 393 | 407 |
| $B_1$ | 343 | 417 | 352 | 371 |
| $B_2$ | 354 | 344 | 336 | 345 |
| Mean | 381 | 381 | 360 | 374 |

**Crop :- Wheat (*Rabi*).** **Ref :- Ms. 64(118).**

**Site :- Agri. Res. Stn., Naragund.** **Type :- 'M'.**

Object :— To study the effect of different levels and sources of $P_2O_5$ on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) Alkaline. (iii) 5.11.64. (iv) 3 harrowing by blade harrow. (b) Seed drill. (c) 45 Kg/ha. (d) 40 cm. (e) Nil. (v) F.Y.M. at 33·6 Q/ha. +33·6 Kg/ha. of N as A/S at the time of sowing. (vi) Amrut. (vii) Unirrigated. (viii) 1 hand weeding. (ix) 107·3 cm. (x) 13.2.65.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 2 levels of $P_2O_5$ : $L_1$=16·8 and $L_2$=33·6 Kg/ha.

(2) 2 sources of $P_2O_5$ : $S_1$=Ammo. Phos. and $S_2$=Supper.

3. DESIGN:

(i) Latin sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 7·6 m.×8·8 m. (b) 6·1 m.×7·3 m. (v) 2 rows of 38 cm. each on all sides. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963-contd. (modified in 1964). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 599 Kg/ha. (ii) 112·4 Kg/ha. (iii) None the effects is significant. (iv) Av. yied of grain in Kg/ha.

Control=557 Kg/ha.

| | $L_1$ | $L_2$ | Mean |
|---|---|---|---|
| $S_1$ | 649 | 563 | 606 |
| $S_2$ | 542 | 683 | 613 |
| Mean | 596 | 623 | 610 |

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**Crop :- Wheat (*Kharif*).** **Ref :- Ms. 60(271).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'C'.**

Object :- - To compare treated seeds with untreated seeds for seedling blight.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Black soil. (iii) 15.10.60. (iv) Ploughing and harrowing. (b) Drilled. (c) 45 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (ix) Weeding and interculturing. (ix) 6·1 cm. (x) 15.1.61.

2. TREATMENTS :

4 seed treatments : $T_1$=Kemphad seeds treaeted with Agrosan, $T_2$=Local seeds trcated with Agrosan, $T_3$=Kemphad seeds untreated and $T_4$=Local seeds untreated.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 7·3 m.×6·1 m. (b) 6·1 m.×4·9 m. (v) 61 cm.×61 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 739 Kg/ha. (ii) 194·7 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 956 | 529 | 922 | 550 |

C.D.=311·5 Kg/ha.

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**Crop :- Wheat (*Rabi*).** **Ref :- Ms. 60(86), 61(52).**

**Site :- Agri. Res. Stn., Gangavathi.** **Type :- 'C'.**

Object :— To find out the optimum seed rate for Wheat in the T.B.P. area where tillering is very sparce.

1. BASAL CONDITIONS :

(i) (a) Sugarcane-Wheat ; *Jowar*—Groundnut—Wheat. (b) Fallow ; Groundnut. (c) Nil ; 140·1 Kg/ha. of Super. (ii) Light black soil. (iii) 4.11.60 ;2.11.61. (iv) (a) 1-2 ploughings and 2-4 harrowings. (b) Drilling. (c) As per treatments. (d) and (e) N.A. (v) 12·4 C.L./ha. of F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (vi) K-28. (vii) Irrigated. (viii) 2 hand weedings and 1 hoeing. (ix) N.A. : Nil. (x) 23, 24.2.61 ; 6.3.62.

2. TREATMENTS :

6 seed rates : $S_1$=34, $S_2$=45, $S_3$=56, $S_4$=67, $S_5$=78 and $S_6$=90 Kg/ha.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) and (b) 18·6 m.×2·7 m. for 60(86), 11·0 m.×4·6 m. for 61 (52). (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960-61. (b) No. (c) Nil (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent.

5. RESULTS :

60(86)

(i) 476 Kg/ha. (ii) 112·9 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 362 | 362 | 524 | 597 | 506 | 506 |

C.D.=149·0 Kg/ha.

61(52)

(i) 640 Kg/ha. (ii) 69·5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 590 | 646 | 669 | 662 | 601 | 669 |

**Crop :- Wheat** (*Rabi*). **Ref :- Ms. 60(85), 61(51).**

**Site :- Agri. Res. Stn., Gangavathi.** **Type :- 'C'.**

Object :— To find out the optimum time of sowing for getting higher yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) *Jowar*-wheat ; Jowar-groundnut-wheat. (b) Nil ; Groundrut. (c) Nil ; 140·1 Kg./ha. of super. (ii) Light black soil. (iii) As per treatments. (iv) (a) 2 ploughings and 2 harrowings. (b) Drilling. (c) 45 Kg./ha. (d) and (e) N.A. (v) 12·4 C.L./ha. of F.Y.M.+44.8 Kg./ha. of N+22.4 Kg,/ha of $P_2O_5$. (vi) K. 28. (vii) Irrigated. (viii) 1-2 hand weedings and 2 hoeings. (ix) N.A. ; 9 cm. (x) 12.2.61 ; 5.3.62.

2. TREATMENTS :

10 days of sowing : $D_1$=15th Oct., $D_2$=22nd Oct., 29th Oct., $D_4$=5th Nov., $D_6$=12th Nov., $D_6$=19th Nov. $D_7$=26 Nov., $D_8$=3rd Dec., $D_9$=10th Dec. and $D_{10}$=17th Dec.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 5. (iv) (a) and (b) 18·4 m.×2·7m. (v) Nil. (iv) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960—1961. (b) No. (c) Results of combined analysis are presented under 5 Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

5. RESULTS :

(i) 281 Kg/ha. (ii) 88·5 Kg/ha. (based on 81 d. f. made up of pooled error and Treatments×years interaction). (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $D_1$ | $D_2$ | $D_3$ | $D_4$ | $D_5$ | $D_6$ | $D_7$ | $D_8$ | $D_9$ | $D_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Mean yield | 347 | 300 | 324 | 304 | 276 | 306 | 270 | 242 | 242 | 200 |

C. D.=78·9Kg/ha.

| | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 522 | 518 | 507 | 497 | 486 | 470 | 457 | 420 | 401 | 317 | ** | 460 | 81·8 |
| 1961 | 172 | 83 | 141 | 110 | 65 | 141 | 83 | 65 | 83 | 83 | N.S. | 103 | 94·4 |
| Pooled | 347 | 300 | 324 | 304 | 276 | 306 | 270 | 242 | 242 | 200 | * | 281 | 88·5 |

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**Crop :- Wheat** (*Rabi*). **Ref :- Ms. 60(93)**

**Site :- Agri. Res. Stn., Sirugoppa.** **Type :- 'CV'.**

Object :- To find out suitable time of sowing and variety to get more yield.

1. BASAL CODITIONS :

(i) *Jowar*—Cotton—Wheat. (b) Jowar. (c) 126 Q/ha. of F.Y.M.+44.8 Kg/ha of Nas A/S+22·4 Kg/ha. of $P_2O_5$ as super. (ii) Black Soil. (iii) As per Treatments. (iv) (a) 2 ploughing by victory plough. (b)and (c) N.A. (d) 28 cm.×27cm. (e) N.A. (v) 126 Q/ha. of F.Y.M.+44 Kg/ha. of Nas A/S+22·4 Kg/ha. of $P_2O_5$ as Super. N applied at the time of sowing by hand. (vi) As per treatments. (vii) Irrigated. (vii) 2 weedings. (ix) 28 cm. (x) 18-2-61 to 18-3-61.

2. TREATMENTS :

**Main-plot treatments :**

6 varieties :- $N_1$=Kemphad, $V_2$=C-253, $V_3$=PW-5, $V_4$=NP-710, $V_5$=K-28 and $V_6$=Hy 11-6.

**Sub-plot treatments :**

4 dates of sowing : $D_1$=13.10.1960., $D_2$=28.10.1960, $D_3$=5.11.1960 and $D_4$=12.11.1960.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 3 (iv) (a) 1/198. ha. (b) 1/247. (v) Two rows on either side. (iv) Yes.

4. GENERAL

(i) Normal. (ii) Yellow nest observed during the latter stage. (iii) Yield of grain. (iv) (a) to(c) No. (v) to (vii) Nil.

5. RESULTS.

(i) 345 Kg/ha. (ii) (a) 258·7 Kg/ha. (b) 95·6 Kg/ha. (iii) Main effect of D alone is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | $V_3$ | $V_4$ | $V_5$ | $V_6$ | Mean |
|---|---|---|---|---|---|---|---|
| $D_1$ | 184 | 285 | 310 | 352 | 398 | 429 | 326 |
| $D_2$ | 327 | 315 | 343 | 331 | 415 | 380 | 352 |
| $D_3$ | 276 | 247 | 229 | 226 | 247 | 367 | 265 |
| $D_4$ | 421 | 495 | 310 | 422 | 448 | 537 | 439 |
| Mean | 302 | 335 | 298 | 333 | 377 | 428 | 345 |

C.D. for D marginal means=64·8 Kg/ha.

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**Crop :- Wheat (*Rabi*).** **Ref :-Ms. 62(31), 63(21), 64(172).**

**Site :- Agri. Res. Stn., Bailhongal.** **Type :- 'CM'.**

Object :— To study the suitable G.M. crop for dry Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) As per treatments. (c) N.A. (ii) Medium black. (iii) 13.10,62 ; 19.10.63 ; 22.10.64. (iv) (a) 1 iron ploughing and 3 to 5 harrowings. (b) Drilling. (c) 45 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) 12 4 C.L./ha. of F.Y.M. for 62(31) and 63(21); 56 Q/ha. of F.Y.M. for 64(172). (vi) Amrut (early). (vii) Unirrigated. (viii) 1 weeding and interculturing. (ix) 20 cm. ; 2 cm. ; 23 cm. (x) 17.1.63 ; 21, 22.1.64 ; 20.1.65.

2. TREATMENTS :

6 previous crops : $C_0$=Fallow (control), $C_1$=Chinamug, $C_2$=Sunnhemp (cut), $C_3$=Sunnhemp (uprooted) and harrowed with disc harrow), $C_4$=Sunnhemp (buried with iron plough) and $C_5$= Groundnut.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 14·6 m.×4·9 m. (b) 13·4 m.×3·7 m. (v) 61 cm.×61 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962-64. (b) No. (c) Results of combined analysis given under 5. (v) and(vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent·

5. RESULTS :

(i) 747 Kg/ha. (ii) 121·3 Kg/ha. (based on 5 d.f. made up of pooled error and Treatments×years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $C_0$ | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 694 | 766 | 767 | 845 | 787 | 624 |

C.D.=99·3 Kg/ha.

| Years | $C_0$ | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|
| 1962 | 1053 | 1073 | 1134 | 1206 | 1189 | 974 | N.S. | 1105 | 118·4 |
| 1963 | 474 | 523 | 465 | 486 | 461 | 408 | N.S. | 470 | 128·7 |
| 1964 | 556 | 701 | 703 | 842 | 712 | 490 | * | 667 | 118·2 |
| Pooled | 694 | 766 | 767 | 845 | 787 | 624 | ** | 747 | 121·3 |

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**Crop :- Wheat (*Rabi*).** **Ref :- Ms. 62(90), 63(89), 64(62).**

**Site :- Agri. Res. Stn., Saundatti.** **Type :- 'CM'.**

Object :— To study the effect of Groundnut and chinamug taken in the *Kharif* season on the succeeding crop of Wheat.

1. BASAL CONDITIONS :

(i) (a) to (c) As per treatments. (ii) Medium black. (iii) 17.10.62 ; 29.10.63 ; 23.10.64. (iv) (a) 2 harrowings. (b) Drill sowing. (c) 45 Kg/ha, (d) 30 cm. between rows. (e) —. (v) 12·4 C.L./ha. of F.Y.M.+ 33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (vi) Amrut. (vii) Unirrigated. (viii) Interculturing and hand weeding. (ix) 12 cm. ; N.A. ; 2 cm. (x) 29.1.63 ; 29.1.64 ; 31 .1.65.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 2 previous crops : $C_1$=Groundnut and $C_2$=China-mug.

(2) 2 manurial treatments: $M_1$=22·4 Kg/ha. of $P_2O_5$ and $M_2$=11·2 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$.

Manures were applied to previous crop in *Kharif* season.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 12·8 m.×8·2 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962-64. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 294 Kg/ha. (ii) 46·7 Kg/ha. (based on 51 d.f. made up of pooled error and Treatments×years interaction). (iii) Main effect of C is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $M_1$ | $M_2$ | Mean |
|---|---|---|---|
| $C_1$ | 254 | 237 | 246 |
| $C_2$ | 339 | 345 | 342 |
| Mean | 296 | 291 | 294 |

C.D. for C marginal means=22·1 Kg/ha.

| Years | $C_1$ | $C_2$ | Sig | $M_1$ | $M_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|
| 1962 | 312 | 446 | ** | 390 | 376 | N.S. | 383 | 53·8 |
| 1963 | 206 | 260 | ** | 243 | 224 | N.S. | 233 | 32·5 |
| 1964 | 211 | 321 | ** | 257 | 274 | N.S. | 267 | 43·0 |
| Pooled | 246 | 342 | ** | 296 | 291 | N.S. | 294 | 46·7 |

**Crop :- Wheat** (*Rabi*). **Ref :- Ms. 60(279).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'IM'.**

Object :— To find out the optimum water and manurial requirements for Wheat.

1. BASAL CONDITIONS :

(i) (a) Maize-Wheat. (b) Maize. (c) F.Y.M. at 12·4 C.L./ha.+33·6 Kg/ha. of N as Urea+11·2 Kg/ha. of $P_2O_5$ as Super+11·2 Kg/ha. of $K_2O$ as Pot. Sul. (ii) Black soil. (iii) 25 and 26.10.60. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) N.A. (d) 30 cm.×23 cm. (e) 2 to 3. (v) 12·4 C.L./ha. of F.Y.M. (vi) Kemphad. (vii) Irrigated. (viii) Gap filling, interculturing, and hand weeding. (ix) 8 cm. (x) 5.3.61.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 2 intensities of irrigation : $I_1$=6·4 and $I_2$=8·9 cm.

(2) 5 manurial treatments : $M_0$=No manure, $M_1$=22·4 Kg/ha. of N as A/S and G.N.C. in 1 : 2 ratio, $M_2$=22·4 Kg/ha. of N as A/S+11·2 Kg/ha, of $P_2O_5$ as Super+11·2 Kg/ha. of $K_2O$ as Pot. Sul., $M_3$=44·8 Kg/ha. of N as A/S and G.N.C. in 1 : 2 ratio and $M_4$=44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$.

N applied in two equal doses 3 and 6 weeks after sowing. $P_2O_5$ and $K_2O$ applied 3 weeks after sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 7·3 m.×6·7 m. (b) 6·4 m.×6·1 m. (v) 46 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Crop effected by rust. (iii) Yield of grain. (iv) (a) 1960-63 (modified every year). (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 797 Kg/ha. (ii) 128·7 Kg/ha. (iii) I effect is significant. (iv) Av. yield of grain in Kg/ha.

| | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|---|
| $I_1$ | 749 | 701 | 742 | 776 | 726 | 739 |
| $I_2$ | 823 | 843 | 897 | 840 | 876 | 856 |
| Mean | 786 | 772 | 820 | 808 | 801 | 797 |

C.D. for I marginal means=98·7 Kg/ha.

**Crop :- Wheat (*Rabi*).** **Ref :- Ms. 61(105).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'IM'.**

Object :— To find out optimum water and manurial requirements of Wheat.

1. BASAL CONDITIONS :

(i) (a) Maize-Wheat. (b) Maize. (c) 24.7 C.L./ha. of F.Y.M. (ii) Medium black soil. (iii) 14.10.61. (iv) (a) Ploughing and harrowing opening furrows. (b) to (e) N.A. (v) 12·4 C.L./ha. of F.Y.M. (vi) Kemphad. (vii) As per treatments. (viii) 2 interculturings and 4 weedings. (ix) 7 cm. (x) 9.2.62.

2. TREATMENTS:

**Main-plot treatments :**

All combinations of (1) and (2).

(1) 3 intervals of irrigation : $D_1=20$, $D_2=25$ and $D_3=30$ days.

(2) 2 intensities of irrigation : $I_1=6·4$ and $I_2=8·9$ cm.

**Sub-plot treatments :**

2 manurial treatments : $M_0$=Control (no manure) and $M_1$=22·4 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$ +11·2 Kg/ha. of $K_2O$.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 7·3 m.×6·7 m. (b) 6·4 m.×6·1 m. (v) 46 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960-63 (modified every year). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1140 Kg/ha. (ii) (a) 211·0 Kg/ha. (b) 91·2 Kg/ha. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $D_1$ | $D_2$ | $D_3$ | $M_0$ | $M_1$ | Mean |
|---|---|---|---|---|---|---|
| $I_1$ | 1184 | 1210 | 1009 | 1059 | 1209 | 1134 |
| $I_2$ | 1169 | 1225 | 1044 | 1104 | 1189 | 1146 |
| Mean | 1176 | 1218 | 1026 | 1081 | 1199 | 1140 |
| $M_0$ | 1123 | 1111 | 1011 | | | |
| $M_1$ | 1230 | 1324 | 1042 | | | |

C.D. for M means=66·2 Kg/ha.

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**Crop :- Wheat (*Rabi*).** **Ref :- Ms. 62(106).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'IM'.**

Object :—To find out optimum water and manurial requirements of Wheat.

1. BASAL CONDITIONS:

(i) N.A. (b) Maize. (c) 24·7 C.L./ha. of F.Y.M. (ii) Medium black soil. (iii) 25.10.62. (iv) (a) Ploughing and harrowing. (b) to (e) N.A. (v) 12·4 C.L./ha. of F.Y.M. (vi) Kemphad. (vii) As per treatments. (viii) 2 interculturings and 3 weedings. (ix) 22 cm. (x) 1.3,63.

2. TREATMENTS :

**Main-plot treatments :**

3 intervals of irrigation : $D_1=20$, $D_2=25$ and $D_3=30$ days.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 2 intensities of irrigation : $I_1=6{\cdot}4$ and $I_2=8{\cdot}9$ cm.

(2) 2 manurial treatments : $M_0$=Control (no manure) and $M_1=22{\cdot}4$ Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$. +11·2 Kg/ha. of $K_2O$.

3. DESIGN :

(i) Split plot. (b) (a) 3 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 7·3 m.×6·7 m. (b) 6·4 m.×6·1 m. (v) 46 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Normal, lodging in the month of Fabruary. (ii) Nil. (iii) Grain yield. (iv) (a) 1960—1963 (modified every year). (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 563 Kg/ha. (ii) (a) 178·0 Kg/ha. (b) 89·6 Kg/ha. (iii) Main effect of M alone is significant. (iv) Av. yield of grain in Kg/ha.

| | $I_1$ | $I_2$ | $M_0$ | $M_1$ | Mean |
|---|---|---|---|---|---|
| $D_1$ | 560 | 545 | 529 | 575 | 552 |
| $D_2$ | 587 | 552 | 537 | 602 | 569 |
| $D_3$ | 511 | 626 | 503 | 634 | 568 |
| Mean | 552 | 574 | 523 | 603 | 563 |
| $M_0$ | 505 | 541 | | | |
| $M_1$ | 600 | 608 | | | |

C D. for M means=62·8 Kg/ha.

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**Crop :- Wheat (*Rabi*).**
**Site :- Agri. Res. Stn., Arbhavi.**

**Ref :- Ms. 63(243).**
**Type :- 'IM'.**

Object :—To find out the optimum water and manurial requirement of Wheat.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat. (b) Maize. (c) N.A. (ii) Medium black soil. (iii) 7.11.63. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) 98·8 Kg/ha. (d) and (e) N.A. (v) Nil. (vi) Kemphad. (vii) As per treatments. (viii) 2 interculturings and 3 weedings. (ix) Nil. (x) 24.2.64.

2. TREATMENTS ;

**Main-plot treatments :**

3 intervals of irrigations : $A_1=20$, $A_2=25$ and $A_3=30$ days.

**Sub-plot treatments:**

All combinations of (1) and (2)

(1) 2 intensities of irrigations : $I_1=6{\cdot}4$ cm. and $I_2=8{\cdot}9$ cm.

(2) 2 levels of N : $N_0=0$ and $N_1=22{\cdot}4$ Kg/ha.

3. DESIGN :

(i) Split—plot. (ii) (a) 3 main-plots/replication, 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 7·3 m.× 6·7 m. (b) 6·4 m.×6·1 m. (v) 46 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960 to 1963 (modified every year). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 808 Kg/ha. (ii) (a) 100·0 Kg/ha. (b) 124·5 Kg/ha. (iii) Main effects of A, N and interaction A×N are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $I_1$ | $I_2$ | $N_0$ | $N_1$ | Mean |
|---|---|---|---|---|---|
| $A_1$ | 996 | 842 | 727 | 1111 | 919 |
| $A_2$ | 804 | 742 | 719 | 827 | 773 |
| $A_3$ | 707 | 757 | 704 | 760 | 732 |
| Mean | 836 | 780 | 717 | 899 | 808 |
| $N_0$ | 751 | 682 | | | |
| $N_1$ | 921 | 878 | | | |

C.D. for A marginal means =113·3 Kg/ha.
C.D. for N marginal means =87·2 Kg/ha.
C.D. for N means at the same level of A=151·0 Kg/ha.
C.D. for A means at the same level of N=156·6 Kg/ha.

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**Crop :- Wheat (*Rabi*).** **Ref :- Ms. 60(MAE).**

**Site :- M.A.E. Centre, Gangavati.** **Type :- 'M'.**

Object :—Type IV : To study the effect of phosphate manuring of legumes and their after effect on the succeeding Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Mung and groundnut. (c) As per treatments. (ii) Deep black, (iii) 7.11.60. (iv) (a) Ploughing and harrowing. (b) By hand drill. (c) 45 Kg/ha. (d) 30 cm.×8 to 10 cm. (e) —. (v) Nil. (vi) NP—710. (vii) Irrigated. (viii) and (ix) N.A. (x) 21, 22.2. 61.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1) and (2)+control $L_0P_0$ (fallow)

(1) 2 legumes crops : $L_1$=Mung and $L_2$=Groundnut.
(2) 3 levels of $P_2O_5$ as Super given to legumes : $P_0$=0, $P_1$=44·8 and $P_2$=89·7 Kg/ha.

**Sub-plot treatments :**

3 levels of N as A/S given to Wheat crop : $N_0$=0, $N_1$=16·8 and $N_2$=33·6 Kg/ha.

3. DESIGN :

(i) Split—plot. (ii) (a) 7 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

GENERAL :

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1958 to 1960. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 386 Kg/ha. (ii) (a) 105·1 Kg/ha. (b) 53·5 Kg/ha. (iii) Main effect of N is significant. N×control Vs. others is highly significant.

| | $L_0P_0$ | $L_1P_0$ | $L_1P_1$ | $L_1P_2$ | $L_2P_0$ | $L_2P_1$ | $L_2P_2$ | Mean |
|---|---|---|---|---|---|---|---|---|
| $N_0$ | 258 | 295 | 341 | 378 | 387 | 452 | 360 | 353 |
| $N_1$ | 424 | 304 | 406 | 470 | 397 | 452 | 480 | 419 |
| $N_2$ | 286 | 305 | 434 | 443 | 360 | 433 | 433 | 385 |
| Mean | 323 | 301 | 394 | 430 | 381 | 446 | 424 | 386 |

C.D. for N marginal means=33·8 Kg/ha.

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**Crop :- Jowar** (*Rabi*).
**Site :- Agri. Res. Stn., Bagalkot.**

**Ref :- Ms. 63(238), 64(206), 65 (79).**
**Tope :- 'M'.**

Object :— To compare the effect of Super with Ammo. Phos.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) Black soil. (iii) Ploughing and harrowing. (b) Drilling. (c) 4·5 Kg/ha. (d) 46 cm.×30 cm. (e)—. (v) Nil for 1963 ; 12·4 C.L./ha. of F.Y.M. in 1964 and 65. (vi) M-35-1 (early). (vii) Unirrigated. (viii) 3 interculturing, two weedings. (ix) 69 cm, ; 61 cm. ; 26 cm. (x) 12.3.64 ; N.A. ; N.A.

2. TREATMENTS:

All combinations of (1) and (2).

(1) 3 levels of Super : $P_0=0$, $P_1=16·8$ and $P_2=33·6$ Kg/ha.
(2) 3 levels of A/phos.: $N_0=0$, $N_1=16·8$ and $N_2=33·6$ Kg/ha.

3. DESIGN ;

(i) Fact. in R.B.D. (ii) (a) 9. (b) 65·8 m.×7·3 m. (iii) 4. (iv) (a) 7·3 m.×7·3 m. (b) 6·4 m.×6·4 m. (v) 91 cm. row alround. (vi) Yes.

4. GENERAL :

(i) Good, crop lodged during last week of Feb. 1964 ; Fair in 1964, 65. (ii) No. (iii) Height of plants, grain yield/plot. (iv) (a) 1963 to 1965. (b) No. (c) As under 5. Results. (v) Nil. (vi) N A. (vii) Error variances are homogeneous, Treatments×years interaction is absent.

5. RESULTS :

(i) 1399 Kg/ha. (ii) 393·8 Kg/ha. (based on 72 d.f. made up of Treatments×years interaction). (iii) Main effect of N is highly significant while that of P is significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | Mean |
|---|---|---|---|---|
| $P_0$ | 924 | 1286 | 1347 | 1186 |
| $P_1$ | 1373 | 1546 | 1615 | 1511 |
| $P_2$ | 1367 | 1522 | 1614 | 1501 |
| Mean | 1221 | 1451 | 1525 | 1399 |

C.D. for N or P marginal means=131·1 Kg/ha.

| Years | $N_0$ | $N_1$ | $N_2$ | Sig | $P_0$ | $P_1$ | $P_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1963 | 1015 | 945 | 982 | N.S. | 937 | 1042 | 964 | N.S. | 980 | 150·3 |
| 1964 | 1366 | 1684 | 1860 | ** | 1338 | 1757 | 1814 | ** | 1637 | 192·6 |
| 1965 | 1284 | 1725 | 1734 | ** | 1283 | 1735 | 1726 | ** | 1581 | 198·0 |
| Pooled | 1221 | 1451 | 1525 | ** | 1186 | 1511 | 1501 | ** | 1399 | 393·8 |

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**Crop :- Jowar (*Rabi*).** **Ref :- Ms. 63(235)**

**Site :- Agri. Res. Stn., Bagalkot.** **Type :- 'M'**

Object :- To study the comparative effect of organic and inorganic manures on *Rabi Jowar* in dry farming.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Deep black soil. (iii) 8.10.63. (iv) (a) 3 harrowing (b) Seed drill (c) 4.5 Kg/ha. (d) 46 cm. × 30 cm. (v) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) 1 weeding. (ix) 69 cm. (x) 15.3.64.

2. TREATMENTS.

8 manurial treatments : $T_0$=Control (no manure, two plots/block) ; $T_1$=2800 Kg./ha. F.Y.M., $T_2$=5600 Kg./ha. of F.Y.M., $T_3$=Equivalent quilities of N P K present in 28000 Kg./ha. of F.Y.M. (Nas A/S), $T_4$=As $T_3$. (Nas Urea), $T_5$=Equivalent quantities of NPK present in 5600 Kg/ha. of F.Y.M. (N as A/S), $T_6$=As $T_5$ (Nas urea) ; $T_7=T_1+T_3$ and $T_7=T_1+T_4$.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) 73·2 m. × 7·3 m. (iii) 3. (iv) (a) 7·3 m. × 7·3 m (b) 6·4 m. × 6·4 m. (v) 91 cm. row alround. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) grain yield (iv) (a) 1960. (b) Yes. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 621 Kg/ha. (ii) 87·1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 549 | 627 | 696 | 578 | 631 | 562 | 663 | 655 | 696 |

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**Crop :- Jowar (*Rabi*).** **Ref :- Ms 63(237)**

**Site :- Agri. Res. Stn., Bagalkot.** **Type :- 'M'**

Object :- To find out the best method of application of fertilizer on dry land *Jowar*

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Deep black soil. (iii) 8.10.63. (iv) (a) 3 harrowings. (b) Seed drill. (c) 4·5 Kg./ha. (d) 46 cm. × 30 cm. (e)—. (v) Nil. (vi) M-35-1. (vii) Unirrigated. (viii) Interculturing and 2 weedings. (ix) 69 cm. (x) 14.3.1964.

2. TREEATMENTS :

6 methods of application of 16·8 Kg/ha. of N+16·8 Kg/ha. of $P_2O_5$ : $M_0$=Control (no ferrtilizer), $M_1$=Normal method of fertilizer spreading, $M_2$=Deep placement 2/3 at the time of ploughing and $\frac{1}{3}$ at the time of sowing, $M_3$=$\frac{1}{3}$ of the fertilizer at the time of sowing and 2/3 at the time of flowering by spraying, $M_4$= Spraying 2/3 at the time of sowing and $\frac{1}{3}$ at the time of flowering by spraying and $M_5$=Full dose at ploughing only.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 11 m.×11 m. (b) 10·1 m,×10·1 m. (v) 91 cm. border rows alround.

4. GENERAL :

(i) Average lodged during the last week of February. (ii) Nil. (iii) Plant height and grain yield. (iv) (a) to (c) No. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 953 Kg/ha. (ii) 133·0 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 819 | 882 | 1170 | 1035 | 940 | 872 |

C. D. =200·4 Kg/ha.

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**Crop :- Jowar (*Rabi*).** **Ref :- Ms. 63(240), 64(205), 65(78).**

**Site :- Agri. Res. Stn., Bagalkot** **Type :- 'M'.**

Object :— To find out the best method and dose of application of Super.

1. BASAL CONDITIONS :

(i) (a) Nil in 1963 ; Cotton-*Jowar* for 64, 65. (b) N.A. in 1963 ; Cotton for 1964 and 1965. (c) Nil in 1963 ; N.A. for 1964 and 65. (ii) Deep black soil. (iii) 6.11.63 ; N.A. ; N.A. (iv) (a) 3 ploughings (1963); ploughing and harrowing in 1964 and 965. (b) Seed drill. (c) 4·5 Kg/ha. (d) 46 cm.×30 cm. (e) N.A. (v) Nil in 1963 ; 12·4 C.L./ha. of F.Y.M. for others. (vi) M-35-1 (early). (vii) Unirrigated. (viii) Interculturing and two weedings and thinning. (ix) 69 cm ; 6! cm. ; 26 cm. (x) 16, 17.3.64 ; N.A. ; N.A.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 4 levels of $P_2O_5$ as Super : $P_0$=0, $P_1$=33·6, $P_2$=100·8 Kg/ha.

(2) 4 methods of application of Super : $M_0$=Drilling, $M_1$=Placement 5·1 cm.×6·1 cm., $M_2$=Broadcasting and $M_3$=Deep placement.

(3) 2 doses of carriers : $C_0$=Super without carrier, $C_1$=Super mixed with carrier cowdung.

3. DESIGN :

(i) Confd. fact. in 1963 ; Fact. in R.B,D. in 1964 and 65. (ii) (a) 8 plots/block and 4 blocks/replication in 1963 ; 32 plots/replication in 1964 and 65. (b) 29·3 m.×58·5 m. in 1963 ; N.A. in 1964 and 65. (iii) 3. (iv) (a) 7·3 m.×7·3 m. (b) 6·4 m.×6·4 m. (v) 46 cm. alround. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1963-66. (b) No. (c) Nil. (v) N.A. (vi) Irregularities in exptl. result occured due to rainless condition ; late laying out of the plots and late application of treatments. (vii) Experiment laid out in 1963 analyed as fact. in R.B.D.

5. RESULTS :

63(240)

(i) 882 Kg/ha. (ii) 143·6 Kg/ha. (iii) Main effect of M and P×C interaction are significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $P_3$ | $M_0$ | $M_1$ | $M_2$ | $M_3$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $C_0$ | 869 | 912 | 854 | 931 | 909 | 938 | 868 | 851 | 892 |
| $C_1$ | 1003 | 847 | 871 | 765 | 884 | 947 | 902 | 753 | 872 |
| Mean | 936 | 880 | 863 | 848 | 897 | 942 | 885 | 802 | 882 |
| $M_0$ | 924 | 893 | 889 | 881 | | | | | |
| $M_1$ | 928 | 997 | 903 | 942 | | | | | |
| $M_2$ | 1029 | 822 | 889 | 800 | | | | | |
| $M_3$ | 863 | 808 | 769 | 769 | | | | | |

C.D. for M marginal means= 83.0 Kg/ha.
C.D. for body of P×C table=117·2 Kg/ha.

64(205)

(i) 1027 Kg/ha. (ii) 216·0 Kg/ha. (iii) Main effect of M is significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $P_3$ | $M_0$ | $M_1$ | $M_2$ | $M_3$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $C_0$ | 964 | 1020 | 1136 | 1098 | 1039 | 1057 | 978 | 1145 | 1055 |
| $C_1$ | 860 | 1033 | 1042 | 1066 | 968 | 940 | 960 | 1131 | 1000 |
| Mean | 912 | 1026 | 1089 | 1082 | 1004 | 998 | 969 | 1138 | 1027 |
| $M_0$ | 903 | 991 | 1141 | 979 | | | | | |
| $M_1$ | 932 | 981 | 999 | 1082 | | | | | |
| $M_2$ | 828 | 891 | 1188 | 968 | | | | | |
| $M_3$ | 985 | 1243 | 1027 | 1298 | | | | | |

C.D. for M marginal means=124·8 Kg/ha.

65(78)

(i) 1308 Kg/ha. (ii) 237·0 Kg/ha. (iii) Interaction P×C is sifinificant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $P_3$ | $M_0$ | $M_1$ | $M_2$ | $M_3$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $C_0$ | 1204 | 1414 | 1301 | 1405 | 1313 | 1378 | 1303 | 1329 | 1331 |
| $C_1$ | 1296 | 1204 | 1394 | 1243 | 1242 | 1340 | 1274 | 1282 | 1284 |
| Mean | 1250 | 1309 | 1348 | 1324 | 1278 | 1359 | 1288 | 1306 | 1308 |
| $M_0$ | 1201 | 1282 | 1261 | 1367 | | | | | |
| $M_1$ | 1291 | 1337 | 1388 | 1419 | | | | | |
| $M_2$ | 1210 | 1294 | 1341 | 1309 | | | | | |
| $M_3$ | 1298 | 1323 | 1401 | 1201 | | | | | |

C·D. for the body of P×C table=193·6 Kg/ha.

**Crop :- Jowar** (*Kharif*). **Ref. :- Ms. 60(172).**

**Site :- Agri. Res. Stn., Bailhongal.** **Type :- 'M'.**

Object :—To find out the best source of N for *Jowar*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Black soil. (iii) 20.7.60. (iv) (a) N.A. (b) Drilling. (c) 4·5 Kg/ha. (d) 45 cm.×15 cm. (e) —. (v) Nil. (vi) BH. 4-1-4 (late). (vii) Unirrigated. (viii) N.A. (ix) 44 cm. (x) 5.1.61.

2. TREATMENTS :

7 sources of 33·6 Kg/ha. of N : $S_0$=Control (No. N), $S_1$=A/S, $S_2$=C/A/N, $S_3$=A/C, $S_4$=Urea, $S_5$=A/S/N $S_6$=and C/N.

The above fertilizers were drilled with 55·4 Kg. of $P_2O_5$ before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 7·6 m.×4·4 m. (b) 6·4 m.×3·2 m. (v) 60 cm.×60 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Height of plant, no. of leaves etc. (iv) (a) 1958 to 1961. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1746 Kg/ha. (ii) 281·7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 1581 | 1760 | 1456 | 1995 | 1916 | 1763 | 1750 |

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**Crop :- Jowar** (*Kharif*). **Ref :- Ms. 61(45).**

**Site :- Agri. Res. Stn., Bailhongal.** **Type :- 'M'.**

Object :—To find out the best source of N for *Jowar*.

1. BASAL CONDITIONS:

(i) (a) *Jowar*-Wheat. (b) Wheat, (c) Nil. (ii) Medium black. (iii) 6.8.61. (iv) (a) 2 harrowings. (b) Drilling. (c) 4Kg/ha. (d) 46 cm.×15 cm. (e) N.A. (v) 12·4 C.L./ha. of F.Y.M.+22·4 Kg/ha. of Super. (vi) B.H. 4-1-4 (late)(vii) Unirrigated. (viii) 3 interculturing and hand weedings. (ix) 23 cm. (x) 26.12.61.

2. TREATMENTS :

6 sources of N at 33·6 Kg/ha. : $S_0$=Control (No N), $S_1$=A/S, $S_2$=C/A/N, $S_3$=A/C, $S_4$=Urea and $S_5$= C/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 7·6 m.×4·1 m. (b) 6.4 m.×3·2 m. (v) 61 cm.×46 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Height of plant, length and breadth of earhead and grain yield. (iv) (a) 1958-N.A. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 1516 Kg/ha. (ii) 224 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 863 | 1583 | 1466 | 1904 | 1646 | 1635 |

C.D.=337·5 Kg/ha.

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**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 60(183), 61(47).**

**Site :- Agri. Res. Stn., Bailhongal.** **Type :- 'M'.**

Object :—To find the optimum time and placement of fertilizers for *Jowar*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. ; Wheat. (c) Nil. (ii) Medium black. (iii) 24.7.60 ; 6.8.61. (iv) (a) 3 harrowings. (b) Drilling. (c) 4 to 5 Kg/ha. (d) 46 cm.×15 cm. (e) N.A. (v) 33·6 Q/ha. of F.Y.M. for 60(183), 12·35 C.L./ha. of F.Y.M. for 61(47). (vi) BH 4-1-4 (late). (vii) Unirrigated. (viii) 3 interculturings and hand weedings. (ix) 23 cm.; 44 cm. (x) 27.12.60 ; 26.12.61.

2. TREATMENTS :

8 times and methods of application of 33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super:
$M_0$=Control (no manure), $M_1$=Drilled, $M_2$=Applied by draw tubes at sowing, $M_3$=At sowing by fertlizer-cum-seed drill, $M_4$=$\frac{1}{2}$ dose by fertilizer appliances and $\frac{1}{2}$ dose by top dressing implements, $M_5$=Broadcast at sowing, $M_6$=Broadcast ($\frac{1}{2}$ at sowing+$\frac{1}{2}$ after $1\frac{1}{2}$ months) and $M_7$=$\frac{1}{2}$ dose by draw tubes and $\frac{1}{2}$ dose by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 7·6 m.×4·4m : 7·6 m.×4·1 m. (b) 6·4 m.×3·2 m. ; 6·4 m.×3·2 m. (v) 60 cm.×60 cm ; 61 cm.×46 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959 to 1961. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous. Treatments×years interaction is absent

5. RESULTS :

60(183)

(i) 1305 Kg/ha. (ii) 374·7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 875 | 1315 | 1861 | 1471 | 1348 | 1234 | 1227 | 1107 |

61(47)

(i) 1278 Kg/ha. (ii) 182·1 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 643 | 1377 | 1320 | 1298 | 1256 | 1385 | 1482 | 1464 |

C.D.=267·9 Kg/ha.

**Crop :- Jowar** (*Kharif*). **Ref :- Ms. 62(33), 63(22), 64(119).**

**Site :- Agri. Res. Stn., Bailhongal.** **Type :- 'M'.**

Object :—To study the possibility of reducing the quantity of F.Y.M. by replacing the same artificial manures.

1. BASAL CONDITIONS :

(i) (a) Wheat-Gram-Jowar. (b) Wheat. (c) 12·4 C.L./ha. of F.Y.M. (ii) Black soil ; medium black. (ii) 25.7.1962 ; 6.7.1963. (iv) (a) 2 to 5 harrowings. (b) Drilling by hand. (c) 3 to 4 Kg/ha. (d) 46 cm.× 30 cm. (e) 2. (v) Nil. (vi) Sorghum vulgare (1962), GM-1-5 (late) (1963) ; Kalangode (late) (1964). (vii) Unirrigated. (viii) 3 intercultivations and 2 weedings. (ix) N.A. ; 27 cm. ; 83 cm. (x) 15.12.1962 ; 10.12.1963 ; 19.12.1964.

2. TREATMENTS :

9 manurial treatments : $M_0$=Control (no manure), $M_1$=2800 Kg/ha. of F.Y.M., $M_2$=5600 Kg/ha. of F.Y.M., $M_3$=Equivalent quantities of NPK present in 2800 Kg/ha. of F.Y.M. but 'N' applied as A/s, $M_4$=As $M_3$. Source of N is Urea, $M_5$=Equivalent quantities of NPK present in 5600 Kg/ha. of F.Y.M. but N applied as A/S ; $M_6$=As $M_5$. Source of N is Urea, $M_7=M_1+M_3$ and $M_8=M_2+M_4$.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 12·5 m.×6·4 m. (b) 10·1 m.×4·6 m. (v) 122 cm.× 91 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. No. of internodes, plants, leaves and plant height etc. (iv) (a) 1962—64. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous. Treatments× years interaction is absent.

5. RESULTS :

**62(33)**

(i) 1234 Kg/ha. (ii) 161·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ | $M_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 1129 | 1127 | 1190 | 1286 | 1301 | 1340 | 1378 | 1079 | 1278 |

**63(22)**

(i) 883 Kg/ha. (ii) 399·9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ | $M_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 595 | 775 | 666 | 1220 | 818 | 919 | 1000 | 943 | 1014 |

**64(119)**

(i) 807 Kg/ha. (ii) 103·3 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ | $M_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 727 | 716 | 669 | 806 | 785 | 995 | 990 | 787 | 789 |

C.D.=150·8 Kg/ha.

**Crop :- Jowar** (*Rabi*). **Ref :- Ms. 63(187), 64(151).**

**Site :- Soil Conservation Res. Stn., Bellary.** **Type :- 'M'.**

Object :—To find out the optimum dose of N and P for economic return.

1. BASAL CONDITIONS :

(i) (a) *Jowar—Jowar*. (b) *Jowar*. (c) As per treatments. (ii) Deep black cotton soil. (iii) 3.9.1963 ; 2.10.1964. (iv) (a) Light harrowing. (b) Seed-drill. (c) 4 Kg/ha. (d) 46 cm. × 23 cm. (e) 1. (v) As per treatments. (vi) M—35—1 (medium). (vii) Unirrigated. (viii) Hand weeding and hoeing. (ix) 18 cm. ; 16 cm. (x) 4.2.1964 ; 6.2.1965.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : $N_0$=0, $N_1$=22·4 and $N_2$=44·8 Kg/ha.

(2) 4 levels of $P_2O_5$ : $P_0$=0, $P_1$=22·4, $P_2$=44·8 and $P_3$=112·0 Kg/ha.

3. DESIGN :

(i) Fact. in R B.D. (ii) (a) 12. (b) 38·4 m. × 25·6 m. (iii) 3. (iv) (a) 30·5 m. × 1·4 m. (b) 18·3 m. × 2 3 m. (v) One row on each side. (vi) Yes.

4. GENERAL :

(i) Satisfactory in 1963 ; lodging in 1964. (ii) Nil. (iii) Grain yield, leaf area and count etc. (iv) (a) 1957-64 (b) Yes. (c) As under 5. Results. (v) and (vi) Nil. (vii) Experiments for the years 1957 to 1959 also considered. Error variances are heterogeneous and Treatments × years interaction is present. Crop failed in 1960 and 1961.1962 N.A.

5. RESULTS :

(i) 545 Kg/ha. (ii) 198·7 Kg/ha. (based on 44 d.f. made up of Treatments × years interaction). (iii) Only N effect is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $_0$ | $P_1$ | $P_2$ | $P_3$ | Mean |
|---|---|---|---|---|---|
| $N_0$ | 467 | 439 | 447 | 498 | 463 |
| $N_1$ | 520 | 543 | 607 | 547 | 554 |
| $N_2$ | 603 | 603 | 682 | 588 | 619 |
| Mean | 530 | 528 | 579 | 544 | 545 |

C.D. for N marginal means=73·2 Kg/ha.

| Years | $N_0$ | $N_1$ | $N_2$ | Sig. | $P_0$ | $P_1$ | $P_2$ | $P_3$ | Sig. | G.M. | S.E./Plot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1963 | 189 | 315 | 370 | ** | 254 | 266 | 323 | 322 | N.S. | 291 | 77·7 |
| 1964 | 870 | 1151 | 1370 | ** | 1076 | 1075 | 1165 | 1206 | N.S. | 1130 | 235·3 |
| Pooled | 463 | 554 | 619 | ** | 530 | 528 | 578 | 544 | N.S. | 545 | 198·7 |

**Crop :- Jowar** (*Rabi*). **Ref :- Ms. 62(203).**

**Site :- Soil Conservation Res Stn., Bellary.** **Type :- 'M'.**

Object : — To evaluate responses to spartin B (a mixture of micro-nutrients) under rainfed conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Deep black cotton soil. (iii) 16.10.1962. (iv) (a) Light harrowing. (b) Dibbling. (c) 4 Kg/ha. (d) 45 cm. × 15 cm. (e) 1. (v) As per treatments. (vi) Hagari-1. (medium). (vii) Unirrigated. (viii) 2 hand weedings and hoeing. (ix) 18 cm. (v) 19.2.63.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 2 levels of manures : $M_1$=F.Y.M. at 5600 Kg/ha. and $M_2$=22·4 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$.

(2) 2 levels of spartin B : $L_0$=0 and $L_1$=370 Kg/ha.

Spartin B is a synthetic mixture of micro-nutrients for Alkaline soils.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 5. (b) 18·3 m. × 3·7 m. (iii) 6. (iv) (a) 3 7 m. × 3·7 m. (b) 2·7 m. × 2·7 m. (v) 46 cm. × 46 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Height measurements and yield of grain. (iv) (a) 1962—64, (modified in 1963). (b) Yes. (c) Nil. (v) Nil. (vi) Heavy and unuasal rains during Dec., 1962. (vii) Nil.

5. RESULTS :

(i) 308 Kg/ha. (ii) 155·3 Kg/ha. (iii) Control Vs. others is highly significant. (iv) Av. yield of grain in Kg/ha.

$T_0$=139 Kg/ha.

| | $M_1$ | $M_2$ | Mean |
|---|---|---|---|
| $L_0$ | 350 | 386 | 368 |
| $L_1$ | 374 | 289 | 332 |
| Mean | 362 | 338 | 350 |

C.D. for control Vs. others=146·3 Kg/ha.

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**Crop :- Jowar** (*Rabi*). **Ref :- Ms. 63(188), 64(150).**

**Site :- Soil Conservation Res. Stn., Bellary.** **Type :- 'M'.**

Object : – To evaluate responses to spartin B (a mixture of micro-nutrients) under rainfed conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Setaria ; *Jowar*. (c) Nil, as per treatments. (ii) Deep black cotton soil. (iii) 28.9.63 ; 3.10.64. (iv) (a) Light harrowing. (b) Dibbling. (c) 4 Kg/ha. (d) 45 cm. × 15 cm. (e) 1. (v) Nil. (vi) M—35-1 (medium (vii) Unirrigated. (viii) 2 hand weedings and hoeing. (ix) 14 cm.; 16 cm. ; (x) N.A. ; 9.2.65.

2. TREATMENTS :

All combinations of (1)and(2) +2 extra treatments :

(1) 2 levels of manures : $M_1$=F.Y.M. at 5600 Kg/ha. and $M_2$=22·4 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$.

(2) 2 levels of spartin B : $L_0$=o and $L_1$=370 Kg/ha.

$T_0$=control, $T_1$=5600 Kg/ha. of F.Y.M.+22·4 Kg/ha. of N+44.8 Kg/ha. of $P_2O_5$.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) 21·9 m.×11·0 m. (iii) 4. (iv) (a) 7·3 m×5·5 m. (b) 5·5 m.×4·3 m. (v) 91 cm.×61 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962 to 1966 (modified in 1963) (b) No. (c) Nil. (vi) Nil. (vii) Error variances are heterogeneous. Treatments × years interaction is absent.

5. RESULTS.

**63(188)**

(i) 673 Kg/ha. (ii) 111.0 Kg/ha. (iii) Extra vs. others effect is significant. (vi) Av. yield of grain in Kg/ha.

$T_0$=555 Kg/ha. and $T_1$=639 Kg/ha.

| | $M_1$ | $M_2$ | Mean |
|---|---|---|---|
| $L_0$ | 765 | 693 | 729 |
| $L_1$ | 2858 | 2700 | 693 |
| Mean | 723 | 699 | 711 |

C.D. for extra vs others=102·4 Kg/ha.

**64(150).**

(i) 1170 Kg/ha. (ii) 238.7 Kg/ha. (iii) $T_0$ vs $T_1$ is highly significant. (iv) Av. yield of grain in Kg/ha.

$T_0$=928 Kg/ha., $T_1$=1461 Kg/ha.

| | $M_1$ | $M_2$ | Mean |
|---|---|---|---|
| $L_0$ | 1130 | 1212 | 1171 |
| $L_1$ | 1115 | 1171 | 1143 |
| Mean | 1122 | 1192 | 1157 |

C.D. for $T_0$ vs $T_1$=359·8 Kg/ha.

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**Crop :- Jowar (*Rabi*).** **Ms. 60(129), 61(117), 62(282).**

**Site :- Agri. Res. Stn., Bijapur.** **Type :- 'M'.**

Object :—To study the effect of different nitrogeneous fertilizers on *Jowar*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M. (ii) Black soil. (iii) 13.9.1960 ; 18.10.1961 ; N.A. (iv) (a) Ploughing, harrowing and clod crushing. (b) Drilling. (c) 7 Kg/ha.(d) 46 cm. between lines. (e) –. (v) Nil. (vi) M—35-1, (vii) Unirrigated. (viii) Interculturing. (ix) 65 cm. ; 6 cm. ; 42 cm. (x) 21.2. 1961 ; 3.3.1962 ; N.A.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 3 levels of N : $N_0=0$, $N_1=16{\cdot}8$ and $N_2=33.6$ Kg/ha.

(2) 5 sources of N : $S_1$=A/S, $S_2$=Urea, $S_3$=A/S/N, $S_4$=C/A/N and $S_5$=Calcium Ammonium Chloride.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 9·1 m.×5·5 m. (b) 7·3 m.×3·7 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL:

(i) Fair in 1960 and 1962; 50% lodging in 1961. (ii) Stem borer attack in 1960. B.H.C. 10% was applied. Mites and sugary disease in 1961. No control measures. Nil in 1962. (iii) Height of plant and grain yield. (iv) (a) 1960 to 1962. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous. Treatments×years interaction is absent.

5. RESULTS :

**60(129).**

(i) 852 Kg/ha. (ii) 180.2 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | Mean |
|---|---|---|---|---|---|---|
| $N_0$ | — | — | — | — | — | 739 |
| $N_1$ | 921 | 908 | 763 | 989 | 869 | 890 |
| $N_2$ | 887 | 823 | 1000 | 939 | 989 | 928 |
| Mean | 904 | 866 | 882 | 964 | 929 | 909 |

C.D. for N marginal means=134.7 Kg/ha.

**61(117).**

(i) 1154 Kg/ha. (ii) 107·3 Kg/ha. (iii) Main effects of S and N are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | Mean |
|---|---|---|---|---|---|---|
| $N_0$ | — | — | — | — | — | 1044 |
| $N_1$ | 1165 | 1219 | 1395 | 1231 | 963 | 1195 |
| $N_2$ | 1204 | 1324 | 1413 | 1104 | 1065 | 1222 |
| Mean | 1184 | 1272 | 1404 | 1168 | 1014 | 1154 |

C.D. for S marginal means=126.9 Kg/ha.
C.D. for N marginal means=80.2 Kg/ha.

**62(282).**

(i) 1898 Kg/ha. (ii) 224·9 Kg/ha. (iii) None of the effect is significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | Mean |
|---|---|---|---|---|---|---|
| $N_0$ | — | — | — | — | — | 1822 |
| $N_1$ | 1900 | 1911 | 1895 | 2145 | 1818 | 1934 |
| $N_2$ | 1902 | 2235 | 1869 | 1902 | 1778 | 1937 |
| Mean | 1901 | 2073 | 1882 | 2024 | 1798 | 1898 |

**Crop :- Jowar** (*Rabi*). **Ref :- Ms. 62(134),**

**Site :- Agri. Res. Stn., Bijapur.** **Type :- 'M'**

Object :—To judge the effect of different nitrogeneous fertilizers on *Rabi Jowar*.

1. BASAL CONDITIONS :

(i)(a) *Jowar*—Wheat. (b) Wheat. (c) 56 Q/ha. of F.Y.M. (ii) (a) Medium black soil : Clayey Texture. (iii) 25.9.62. (iv) (a) 3 harrowings. (b) Seed-cum-fertilizer drill. (c) 7 Kg/ha. (d) 46 cm. between rows. (e) – . (v) Nil. (vi) M-35-1 (medium). (vii) Unirrigated. (viii) Intercultrings. (ix) 42 cm. (x) 18.2.63.

2. TREATMENTS :

All combinations of (1) and (2)+control (7 plots) :
(1) 4 sources of N : $S_1$=A/S, $S_2$=Urea, $S_3$=A/S/N and $S_4$=C/A/N.
(2) 2 levels of N : $N_1$=16.8 and $N_2$=33·6 Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 15. (b) 27·5 m.×27·5 m. (iii) 3. (iv) (a) 9·2 m.×5·5 m. (b) 7·3 m.×3·7 m.(v) 2 rows on either side. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Effected by Sugary disease and rust. (iii) Height of plants and yield of grain. (iv) (a) 1962 only. (b) No. (c) Nil. (v) Nil. (vi) Abnormal rains during 1st week of Dec. adversely affected the crop. (vii) Nil.

5. RESULTS :

(i) 1895 Kg/ha. (ii) 228·1 Kg/ha. (iii) Control vs others effect alone is highly significant. (iv) Av. yield of grain in Kg/ha.

Control=1812 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $N_1$ | 1898 | 1909 | 1892 | 2142 | 1960 |
| $N_2$ | 1901 | 2233 | 1867 | 1901 | 1976 |
| Mean | 1900 | 2071 | 1880 | 2022 | 1968 |

C.D. for control vs others=138·6 Kg/ha.

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**Crop :-Jowar** (*Rabi*). **Ms. 60(264), 61(116), 62(263).**

**Site :- Agri. Res. Stn., Bijapur.** **Type: - 'M'.**

Object ;—To find out the optimum combination of N, P and K for obtaining increased yield under rainfed conditions.

1. BASAL CONDITIONS.

(i) (a) Nil. (b) *Rabi Jowar* (c) 9·8 C.L./ha. of F.Y.M. in 1960 ; 12·4 C.L./ha. of F.Y.M. in 1961 and 1962. (ii) Medium black. (iii) 12.9.1960 ; 14.10.1961 ; 24.9.1962. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 14·8 Kg/ha. ; 7 Kg/ha. ; 6.7 Kg/ha. (d) 46 cm. between rows. (e) —. (v) Nil. (vi) M-35-1 (medium). (vii) Unirrigated. (viii) 3 interculturings in 1960 and 1961; 1 weeding. (ix) 76 cm.; 6 cm.; 70 cm. (x) 21.2 1961; 2.3.1962; 27.2.1963.

2. TREATMENTS :

All combinations of (1), (2) and (3) :

(1) 3 levels of N as A/S : $N_0=O$, $N_1=16{\cdot}8$ and $N_2=33{\cdot}6$ Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_0=O$, $P_1=16{\cdot}8$ and $P_2=33{\cdot}6$ Kg/ha.
(3) 3 levels of $K_2$ O as Potash : $K_0=0$, $K_1=16{\cdot}8$ and $K_2=33{\cdot}6$ Kg/ha.

3. DESIGN :

(i) $3^3$ confd. partially. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) 49·4 m.×9·1 m. (iii) 2. (iv) 9·1 m.×5·5 m. (b) 7·3 m.×3·5 m. (v) 2 rows on either side. (v ) Yes.

4. GENERAL :

(i) Normal. (ii) Severe attack of stem borer and heavy incidence of sugary disease during Oct.and Nov. respectively in 1960, mites to some extent at sugary disease in 1961, slight incidence of red leaf rust, and sugary diseases in 1962. (iii) Plant height, no. of inter-nodes, yield of grain etc. (iv) (a) 1959 to 1962 (b) No. (c) Nil. (v) and(vi)Nil. (vii) Error variances are heterogenous. Treatments×years interaction is absent.

5. RESULTS :

**60(264).**

(i) 797 Kg/ha. (ii) 88·8 Kg/ha. (iii) Main effect of N, P and interaction N×P are highly significant, Interaction N×P×K is also signficant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 717 | 497 | 533 | 596 | 580 | 571 | 582 |
| $N_1$ | 787 | 743 | 816 | 784 | 746 | 816 | 782 |
| $N_2$ | 1065 | 1078 | 938 | 984 | 1077 | 1020 | 1027 |
| Mean | 856 | 773 | 762 | 788 | 801 | 802 | 797 |
| $K_0$ | 898 | 743 | 723 | | | | |
| 1 | 857 | 776 | 776 | | | | |
| $K_2$ | 820 | 799 | 788 | | | | |

C.D. for N or P marginal means=61·4 Kg/ha.
C.D. for the body of N×P table=106·3 Kg/ha.

**61(116).**

(i) 987 Kg/ha. (ii) 298·5 Kg/ha. (iii) None of the effect is significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 974 | 950 | 886 | 901 | 882 | 1027 | 937 |
| $N_1$ | 1086 | 791 | 1041 | 1086 | 941 | 891 | 973 |
| $N_2$ | 984 | 1101 | 1069 | 961 | 1157 | 1036 | 1051 |
| Mean | 1015 | 947 | 999 | 983 | 993 | 985 | 987 |
| $K_0$ | 955 | 839 | 1154 | | | | |
| $K_1$ | 1016 | 994 | 970 | | | | |
| $K_2$ | 1073 | 1009 | 872 | | | | |

**62(263).**

(i) 1465 Kg/ha. (ii) 150·2 Kg/ha. (iii) Main effect of N is highly significant and that of P is significant. (vi) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 1164 | 1229 | 1281 | 1266 | 1191 | 1227 | 1225 |
| $N_1$ | 1467 | 1524 | 1627 | 1578 | 1510 | 1530 | 1539 |
| $N_2$ | 1712 | 1470 | 1712 | 1628 | 1641 | 1625 | 1631 |
| Mean | 1448 | 1408 | 1540 | 1487 | 1447 | 1461 | 1465 |
| $K_0$ | 1424 | 1419 | 1619 | | | | |
| $K_1$ | 1470 | 1334 | 1538 | | | | |
| $K_2$ | 1449 | 1470 | 1463 | | | | |

C.D. for N or P marginal means=103·8 Kg/ha.

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**Crop :- Jowar (*Rabi*).** **Ref :- Ms. 60(285), 61(275).**

**Site :- Agri. Res. Stn., Bijapur.** **Type :- 'M'.**

Object :—To study the residual effect of fertilizers applied to the previous crop of Bengal gram on the succeeding *Rabi Jawar*.

1. BASAL CONDITIONS :

(1) (a) *Jowar*-Gram. (b) Gram. (c) As per treatments. (ii) Black soil. (iii) N.A. (iv) (a) Ploughing and harrowing. (b) Seed drill. (c) 6·7 Kg/ha. (d) 45 cm. between rows. (e) Irregular. (v) NIl. (vi) M—35—1 (medium). (vii) Unirrigated. (viii) 3 intercultures. (ix) N.A. (x) 24.2.1961 ; 4.3. 1962.

2. TREATMENTS :

All combinations of (1) and (2)+a control (no manure)
(1) 2 levels of N as A/S : $N_0$=0 and $N_1$=11·2 Kg/ha. of N.
(2) 2 levels of $P_2O_5$ as Super : $P_1$=16·8, and $P_2$=33·6 Kg/ha. of $P_2O_5$ as Super.
Treatments applied to the previous crop of gram.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 18·3 m.×15·2 m. ; 18·3 m.×12·2 m. (iii) 4. (iv) (a) 15·2 m.×3·7 m. ; 12·2 m.×3·7 m. (b) 13·4 m.×1·8 m. ; 10·4 m.×2·7 m. (v) 4 and 2 border rows kept. (vi) Yes.

4. GENERAL :

(i) N.A.; Normal. (ii) Severe incidence of stem borer and sugary disease during Oct. and Nov. 1960 ; slight incidence of mites and sugary disease in 1961. (iii) Yield of grain. (iv) (a) 1958 to 1961. (b) No. (c) Nil. (v) N.A. (vi) Continuous heavy rain after sowing during September 1960. (vii) Error variances are heterogeneous and Treatments×years interaction is absent.

5. RESULTS :

**60(285).**

(i) 1611 Kg/ha. (ii) 205·1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=1631 Kg/ha.

| | $N_0$ | $N_1$ | Mean |
|---|---|---|---|
| $P_1$ | 1329 | 1707 | 1518 |
| $P_2$ | 1713 | 1673 | 1693 |
| Mean | 1521 | 1690 | 1606 |

**61(275)**

(i) 603 Kg/ha. (ii) 186·8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=594 Kg/ha.

| | $N_0$ | $N_1$ | Mean |
|---|---|---|---|
| $P_1$ | 680 | 515 | 597 |
| $P_2$ | 508 | 718 | 613 |
| Mean | 594 | 616 | 605 |

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**Crop :- Jowar (*Rabi*).** **Ref :- Ms. 60(284), 61(274), 62(277), 63(245).**

**Site :- Agri. Res. Stn., Bijapur.** **Type :- 'M'.**

Object :—To study the effect of sunnhemp G.M. on *Jowar*.

## 1. BASAL CONDITIONS :

(i) Nil. (b) *Jowar*. (c) 12.C.L./ha. of F.Y.M.+16·8 Kg/ha. of N as A/s. (ii) Black soil. (iii) 28.9.1963 for 63(245); N.A. for others. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 6·7 Kg/ha. (d) 45 cm. between lines. (e) N.A. (v) Nil. (vi) M—35—1. (vii) Unirrigated. (viii) Hand weeding and interculturing. (ix) 65 cm. ; N.A.; 42 cm. ; 22 cm. (x) 5.3.1964 for 63(245); N.A. for other years.

## 2. TREATMENTS :

8 manurial treatments : $T_0$=Control (no G.M.), $T_1$=Growing sunnhemp and harrowing after one month, $T_2$=Growing sunnhemp+11·2 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$ and harrowing after one month, $T_3$=Growing sunnhemp and burying after 1½ months, $T_4$=Growing sunnhemp+11·2 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$ and burying after 1½ months, $T_5$=Growing sunnhemp and bury after 2 months, $T_6$=Growing sunnhemp+11·2 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$ and burying after 2 months and $T_7$=Growing sunnhemp and cut after 2 months.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×5·5 m. (b) 7·3 m.×3·7 m. (v) 91 cm.×91 cm. (vi) Yes.

## 4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1960 to 1963. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments× years interaction is present.

## 5. RESULTS :

(i) 1099 Kg/ha. (ii) 408·7 Kg/ha. [based on 21 d.f. made up of Treatments×years interaction]. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 1021 | 933 | 1200 | 1339 | 1177 | 1093 | 1212 | 820 |

C.D.=306·9 Kg/ha.

| Years | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 1245 | 1213 | 1280 | 1298 | 1420 | 1380 | 1621 | 1277 | N.S. | 1342 | 331·9 |
| 1961 | 792 | 680 | 707 | 1127 | 587 | 268 | 361 | 299 | N.S. | 603 | 170·9 |
| 1962 | 961 | 957 | 1430 | 1339 | 1213 | 1402 | 1451 | 846 | N.S. | 1200 | 178·4 |
| 1963 | 1085 | 882 | 1384 | 1592 | 1487 | 1321 | 1416 | 857 | ** | 1253 | 269.4 |
| Pooled | 1021 | 933 | 1200 | 1339 | 1177 | 1093 | 1212 | 820 | * | 1099 | 408·7 |

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**Crop :- Jowar (*Rabi*).** **Ref :- Ms. 60(287), 61(276), 62(279).**

**Site :-Agri. Res. Stn., Bijapur.** **Type :- 'M'.**

Object :—To find out suitable placement method of fertilizer to *Jowar*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) 12·4 C.L. /ha. of F.Y.M. (ii) Black soil. (iii) 13.10.60 ; 12.10.61 ; 26.9.62. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 4·5 Kg/ha. for 60(287) and 6·7 Kg/ha. for 61(276) and 62(279). (d) 46 cm. between lines. (e) —. (v) Nil. (vi) M—35—1. (vii) Unirrigated. (viii) Top dressing and interculturing. (ix) 65 cm. ; N.A. ; 42 cm. (x) N.A. ; 4.3.62 ; 28.2.63.

2. TREATMENTS :

All combinations of (1) and (2)+a control

(1) 2 levels of fertilizers : $L_1$=16·8 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$ and $L_2$=2 $L_1$

(2) 7 methods of application of fertilizers : $M_1$=Drilling both ways before sowing, $M_2$=By seed cum-fertiliser drill to drop the fertiliser 5 cm. away and 5 cm. deep from the seed lines, $M_3$=By seed cum fertiliser drill to drop the fertiliser in the same line where the seed is sown, $M_4$=By plough sole method to drop the fertiliser 13 cm. deep with wooden plough one week before sowing, $M_5$=By attaching draw tube behind the drill, $M_6$=In two equal doses. First dose by S.C.F. drill to drop the fertiliser in the same line where the seed is sown, 2nd dose by top dressing drill to drop 7·6 cm. and away and 5 cm. deep from the crop line 1½ months after the first dose and $M_7$= In two equal doses by S.C.F. drill to drop the fertiliser 5 cm. away and 5 cm. deep from the seed line—2nd dose by top dressing drill 7·6 cm. away and 5 cm. deep from the crop line on either sides as bund after 1½ month of 1st dose.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 2. (iv) (a) 8·2 m.×5·5 m. (b) 7·3 m.×3·7 m. (v) and (vi) Yes.

4. GENERAL :

(i) Lodging. (ii) Nil. (iii) Gram yield. (iv) (a) 1960 to 1962. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous. Treatments×years interaction is absent.

5. RESULTS :

60(287)

(i) 1134 Kg/ha. (ii) 373·3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *Jowar* in Kg/ha.

Control=932 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ | Mean |
|---|---|---|---|---|---|---|---|---|
| $L_1$ | 1007 | 906 | 980 | 954 | 1510 | 1166 | 826 | 1050 |
| $L_2$ | 1250 | 1134 | 1362 | 1489 | 1605 | 932 | 964 | 1248 |
| Mean | 1129 | 1020 | 1171 | 1221 | 1557 | 1049 | 895 | 1149 |

**61(276)**

(i) 1031 Kg/ha (ii) 324·5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of Jowar in Kg/ha.

Control=1129 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ | Mean |
|---|---|---|---|---|---|---|---|---|
| $L_1$ | 1163 | 1154 | 917 | 700 | 1271 | 1520 | 794 | 1074 |
| $L_2$ | 1069 | 886 | 1319 | 802 | 821 | 697 | 1225 | 974 |
| Mean | 1116 | 1020 | 1118 | 751 | 1046 | 1108 | 1009 | 1024 |

**62(279)**

(i) 1473 Kg/ha. (iii) 139·2 Kg/ha. (iii) Main effect of M is significant and effect of L is highly significant. (iv) Av. yield of Jowar in Kg/ha.

Control=1018 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | $S_7$ | Mean |
|---|---|---|---|---|---|---|---|---|
| $L_1$ | 1470 | 1426 | 1544 | 1337 | 1377 | 1274 | 1191 | 1374 |
| $L_2$ | 1697 | 1724 | 1715 | 1666 | 1774 | 1521 | 1361 | 1637 |
| Mean | 1584 | 1575 | 1630 | 1501 | 1575 | 1397 | 1276 | 1505 |

C.D. for M marginal means=211·1 Kg/ha.
C.D. for L marginal means=112·9 Kg/ha.

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**Crop :- Jowar (*Rabi*).** **Ref :- Ms. 60(283).**

**Site :- Agri. Res. Stn., Bijapur.** **Type :- 'M'.**

Object :—To study the effect of N and applied at different times on the yield of Jowar.

1. BASAL CONDITIONS :

(i) (a) Jowar-Gram. (b) Gram. (c) 10 C.L./ha. of F.Y.M. (ii) Limy soil. (iii) 14.1.1960. (iv) (a) Ploughing and harrowing. (b) By seed drill. (c) 6·7 Kg/ha. (d) 45 cm. between rows. (e) —. (v) Nil. (vi) M. 35-1. (medium). (vii) Unirrigated. (viii) One interculturing and one weeding. (ix) 65 cm. (x) 21.2.1961.

2. TREATMENTS :

9 manurial treatments : $T_0$=Control (no manure), $T_1=N_1$ while sowing. $T_2=N_1+P_1$ while sowing, $T_3$= $N_1$ after 1 month, $T_4=T_1+T_3$, $T_5=T_3+P_1$ while sowing, $T_6=N_2$ while sowing+$N_2$ after 1 month and $T_7=T_6+P_1$ while sowing.

$N_1$=11·2 Kg/ha. of N, $N_2$=5·6 Kg/ha. of N and $P_1$=11·2 Kg/ha. of $P_2O_5$.

Fertilizers applied by seed-cum-fertilizer drill

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) 18·2 m.×16·5 m. (iii) 4. (iv) (a) 9·1 m.×4·1 m. (b) 7·3 m.×2·3 m. (v) 2 rows on each side. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of grain, straw and chaff. (iv) (a) 1958 to 1960. (b) No. (c) Nil. (v) N.A. (vi) Heavy and continuous rains after sowing. (vii) Nil.

5. RESULTS ;

(i) 1370 Kg/ha. (ii) 134·9 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 1216 | 1227 | 1186 | 1437 | 1547 | 1539 | 1382 | 1424 |

C.D.=198·3 Kg/ha.

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**Crop :- Jowar.** **Ref :- Ms. 65(75).**

**Site :- Agri. Res Stn., Bijapur.** **Type :- 'M'.**

Object :—To study the possibility of introducing Am. Phos. as a carrier of $P_2O_5$ for the Calcareous soils of dry treat where response to Single Super is not forthcoming.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar* (c) 12·4 C.L./ha. of F.Y.M. (ii) Loamy soil to medium black. (iii) 25.9.65. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) 6·7 Kg/ha. (d) 46 cm.×23 cm. (e) 2 to 3 thinned to one. (v) 12·4 C.L/ha. of F.Y.M. (vi) M-35-1. (vii) Unirrigated. (viii) Interculturing and weeding. (iv) 6 cm. (x) 4.2.1966.

2. TREATMENTS :

All combinations of (1) and (2)+ a control (no manure)

(1) 2 sources of $P_2O_5$ : $S_1$ =Ammo. Phos. and $S_2$=Super.
(2) 2 levels of $P_2O_5$ : $P_1$=15 and $P_2$=30 Kg/ha.

3. DESIGN :

Fact. in R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 12·2 m.×5.5 m. (b) 10·4 m.×3·7 m. (v) and (iv) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1965 to 1967 (b) and (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 730 Kg/ha. (ii) 99.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=743 Kg/ha.

| | $P_1$ | $P_2$ | Mean |
|---|---|---|---|
| $S_1$ | 741 | 718 | 730 |
| $S_2$ | 711 | 738 | 724 |
| Mean | 726 | 728 | 727 |

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**Crop :- Jowar (*Rabi*).** **Ref :- Ms. 64(200), 65(71).**

**Site :- Agri. Res. Stn., Bijapur.** **Type :- 'M'.**

Object :– To study the effect of foliar application of N on *Rabi Jowar*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar* (c) 12·4 C.L /ha. of F.Y.M.+16·8 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$. (ii) Black soil. (iii) 25.9.1964 ; 26.9.1965. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) 6·7 Kg/ha. (d) 46 cm.×23 cm. (e) 3 (thinned to 1). (v) Nil. (vi) M 35—1. (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 34 cm. ; 57 cm. (x) 2.3. 1965 ; 10.2.1966.

2. TREATMENTS :

9 manurial treatments : $T_0$=Control (no manure), $T_1$=12·4 C.L./ha. of F.Y.M., $T_2$=16.8 Kg/ha. of N at sowing, $T_3$=28·0 Kg/ha. of N, ½ at sowing and ½ one month after sowing, $T_4$=11·2 Kg/ha. of N as soil application+5·6 Kg/ha. of N as spray at grand period, $T_5$=5·6 Kg/ha. of N as soil application+5·6 Kg/ha. of N as spray at grand period+5·6 Kg/ha. of N as spray at heading stage,$T_6$=11.2 Kg/ha. of N as soil application+5·6 Kg/ha. of N as spray at heading stage,$T_7$=16·8 Kg/ha. of N as soil application+5.6 Kg/ha. of N as spray at grand period+5·6 Kg/ha. of N as spray-heading stage and $T_8$= 16·8 Kg/ha. of N (spray) in 3 equal doses.

3. DESIGN :

(i) R.B D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) 9·1 m.×4·6 m. (b) 7·9 m.×3·7 m. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1964 to 1966. (b) No. (c) Nil. (v) N.A, (vi) and (vii) Nil.

5. RESULTS :

**64(200)**

(i) 1969 Kg/ha. (ii) 196·0 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 1704 | 1485 | 2179 | 2211 | 2026 | 2011 | 2108 | 2233 | 1760 |

C.D.=286·1 Kg/ha.

**65(71)**

(i) 829 Kg/ha. (ii) 221·2 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 835 | 807 | 755 | 748 | 772 | 550 | 804 | 904 | 1285 |

C.D=322·8 Kg/ha.

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**Crop :- Jowar (*Rabi*).** **Ref :- Ms. 62(280), 63(247), 64(198), 65(70).**

**Site :- Agri. Res. Stn., Bijapur.** **Type :- 'M'.**

Object :—To find out suitable method of application of fertilizers.

### 1. BASAL CONDITIONS :

(i) (a) *Jowar*. (b) *Jowar*. (c) N.A. (ii) Black soil. (iii) 27.9.62; 28.9.63; 24.9.64; 25.9.65. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 6·7 Kg/ha. (d) 46 cm. between lines. (e) N.A. (v) Nil, (vi) M. 35—1. (vii) Unirrigated. (viii) 2 interculturings. (ix) 42 cm.; 22 cm.; 26 cm.; 6 cm. (x) 2.3.63; 7,3.64; 4.3.65 and 8.2.66.

### 2. TREATMENTS :

6 methods of application of 16·8 Kg/ha. of N : $T_1$=Control (no manure), $T_2$=Application of N by seed cum fertilizer drill at sowing, $T_3$=Deep placement of fertilizer 2/3 dose of N by plough with out mould board and $\frac{1}{3}$ dose by spray, $T_4$=2/3 dose of N at sowing by seed cum fertilizer drill+$\frac{1}{3}$ dose by spray, $T_5$=$\frac{1}{3}$ dose of N at sowing by seed cum fertilizer drill+2/3 dose by spray and $T_6$=Full dose of N by wooden plough at sowing.

### 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 12·2 m.×32·9 m. (iii) 4. (iv) (a) 5·5m.×12·5m. (b) 3·7 m.×10·4 m. (v) 91 cm.×91cm. (vi) Yes.

### 4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962 to 1965. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous. Treatments×years interaction is present.

### 5. RESULTS :

(i) 1123 Kg/ha. (ii) 238·6 Kg/ha. (based on 15 d.f. made up of Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 1009 | 1097 | 1146 | 1204 | 1090 | 1192 |

| Years | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_4$ | $T_6$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|
| 1962 | 1117 | 1064 | 1037 | 1318 | 1130 | 1252 | N.S. | 1153 | 178·1 |
| 1963 | 1084 | 1231 | 1489 | 1345 | 1228 | 1356 | N.S. | 1289 | 167·9 |
| 1964 | 920 | 1238 | 1285 | 1280 | 1125 | 1409 | ** | 1209 | 90·4 |
| 1965 | 913 | 854 | 772 | 872 | 879 | 751 | N.S. | 840 | 134·8 |
| Pooled | 1009 | 1097 | 1146 | 1204 | 1090 | 1192 | N.S. | 1123 | 238·6 |

**Crop :- Jowar** (*Kharif*). **Ref :. Ms. 60(130), 61(112), 62(64), 63(56).**

**Site :- College of Agriculture,**
**Dharwar.** **Type :- 'M'.**

Object :—To find out the suitable method of application of fertilizers to Jowar.

1. BASAL CONDITIONS :

(i) (a) N.A.; Nil; *Jowar*-Cotton. (b) N.A.; N.A.; Cotton. (c) N.A.; N.A.; 4·9 C.L./ha. of F.Y.M.; 12·4 C.L./ha. of F.Y.M. (ii) Black soil. (iii) 14.7.60; 24.7.61; 21.7.62; 13.7.63. (iv) (a) Ploughing and harrowing ; ploughing, clod crushing and harrowing; 1 tractor ploughing and 1 harrowing; 3 harrowings. (b) Drilling. (c) 4 Kg/ha.; (d) 38 cm. between rows ; N.A. ; 46 cm. between rows ; N.A. (e) N.A. (v) Nil. (vi) *Nandyal* (late). (vii) Unirrigated. (viii) Weeding and interculturing in 1960, 61 and 63 ; Nil for 62. (ix) 46 cm. (1960); N.A. for others. (x) 27.12.1960 ; 18.12.61; 15.1.63; 19.12.63.

2. TREATMENTS :

All combinations of (1) and (2)+a control

(1) 2 manurial treatments : T$_1$=33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of P$_2$O$_5$ as Super and T$_2$=50·4 Kg/ha. of N as AS+33·6 Kg/ha. of P$_2$O$_5$ as Super.

(2) 7 methods of application : M$_1$=Broadcasting, M$_2$=Drilling both ways before sowing, M$_3$= Applied 5 cm. away and 5 cm. deep from the seed line by s.c.f. drill, M$_4$=Applied in the same line where the seed is sown by s.c.f. drill, M$_5$=To drop 2·5 cm. deeper than the seed in the same line where the seed is sown, M$_6$=½ dose by s.c.f. drill in the same line where the seed is sown+½ dose after 1½ months by top dressing drill 5 cm. away and 5 cm. deep from the crop line and M$_7$=½ dose by s.c.f. drill 5 cm. away and 5 cm. deep from the seed line+½ dose after 1½ months by top dressing drill 8 cm. away and 5 cm. deep from the crop line.

s.c.f. drill means seed-cum-fertilizer drill.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×5·8m.; 9·1 m.×5·7 m. in 1961 and 62; 9·1 m.× 6·1 m. (b) 7·9 m.×5·0 m.; 7·9 m.×5·0 m. in 61 and 62; 7·9 m.×5·0 m. (v) 61 cm.×38 cm. in 1960 to 62; 61 cm.×53 cm. in 63. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1960 to 63. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogenous and Treatments×years interaction is present.

5. RESULTS :

(i) 2115 Kg/ha. (ii) 371·3 Kg/ha. (based on 42 d.f. made up of Treatments×years interaction). (iii) Main effect of T is highly significant. M effect is significant. Control *vs.* others is highly significant. (iv) Av. yield of grain in Kg/ha.

Control=1470 Kg/ha.

| | M$_1$ | M$_2$ | M$_3$ | M$_4$ | M$_5$ | M$_6$ | M$_7$ | Mean |
|---|---|---|---|---|---|---|---|---|
| T$_1$ | 1927 | 2193 | 1933 | 2262 | 2014 | 2254 | 2023 | 2087 |
| T$_2$ | 2276 | 2256 | 2207 | 2254 | 2134 | 2405 | 2138 | 2239 |
| Mean | 2103 | 2224 | 2070 | 2258 | 2074 | 2330 | 2080 | 2163 |

C.D. for M marginal means=187·4 Kg/ha.
C.D. for T marginal means=100·2 Kg/ha.
C.D. for control *vs.* others=194·0 Kg/ha.

| Years | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ | Sig. | $S_1$ | $S_2$ | $S_3$ | Sig. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 1974 | 2214 | 1659 | 2097 | 1998 | 2422 | 1859 | * | 1939 | | 2126 | * |
| 1961 | 3050 | 3052 | 2786 | 3102 | 2688 | 3237 | 2922 | N.S. | 2948 | | 3005 | * |
| 1962 | 1559 | 1845 | 1765 | 1858 | 1714 | 1904 | 1801 | N.S. | 1684 | | 1872 | * |
| 1963 | 1822 | 1785 | 2073 | 1976 | 1897 | 1755 | 1839 | * | 1776 | | 1979 | ** |
| Pooled | 2103 | 2224 | 2070 | 2258 | 2074 | 2330 | 2080 | * | 2087 | | 2239 | ** |

| Control | G.M. | S.E./plot |
|---|---|---|
| 1466 | 1966 | 332·3 |
| 2034 | 2914 | 383·6 |
| 950 | 1723 | 217·6 |
| 1428 | 1828 | 206·2 |
| 1470 | 2115 | 371·3 |

**Crop :- Jowar** (*Kharif*).

**Ref :- Ms. 60(131), 61(113), 62(63), 63(57).**

**Site :- College of Agriculture,**
**Dharwar.**

**Type :- 'M'.**

Object :—To find out the suitable method of application of fertilisers to Jowar in red soil.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red sandy loam. (iii) 8.7.60; 31.7.61; 21.7.62; 11.7.63. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 4 Kg/ha. (d) 46 cm. between rows. (e) N.A. (v) Nil. (vi) *Nandyal.* (vii) Unirrigated. (viii) Interculturing and weeding. (ix) 46 cm.; N.A.; N.A.; N.A. (x) 15,12.60 ; 20.12.61; 15.1.63; 12.12.63.

2. TREATMENTS:

Same as in expt. no. 60(130), 61(112), 62(64), 63(56) on page 179.

3. DESIGN ;

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 8·2 m. × 5·5 m. (b) 7·3 m. × 4·6 m. (v) 46 cm. × 46 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960 to 63. (b) No. (c) As under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous. Treatments × years interaction is present.

5. RESULTS :

(i) 1504 Kg/ha. (ii) 488·1 Kg/ha. (based on 42 d.f. made up of Treatments × years interaction). (iii) Main effect of T is significant. Control *vs.* others is highly significant. (iv) Av. yield of grain in Kg/ha.

Control=939 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ | Mean |
|---|---|---|---|---|---|---|---|---|
| $T_1$ | 1428 | 1448 | 1352 | 1592 | 1461 | 1468 | 1452 | 1457 |
| $T_2$ | 1583 | 1704 | 1506 | 1711 | 1658 | 1675 | 1576 | 1630 |
| Mean | 1505 | 1576 | 1429 | 1651 | 1560 | 1571 | 1514 | 1544 |

C.D. for T marginal means=131·7 Kg/ha.
C.D. for control *vs.* others=255·0 Kg/ha.

| Years | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ | Sig. |
|---|---|---|---|---|---|---|---|---|
| 1960 | 805 | 827 | 733 | 872 | 932 | 787 | 775 | N.S. |
| 1961 | 1668 | 1438 | 1698 | 1592 | 1961 | 1872 | 1814 | * |
| 1962 | 2155 | 2397 | 1807 | 2678 | 1786 | 2015 | 1941 | N.S. |
| 1963 | 1395 | 1643 | 1478 | 1463 | 1562 | 1613 | 1526 | N.S. |
| Pooled | 1505 | 1576 | 1429 | 1651 | 1560 | 1571 | 1514 | N.S. |

| $T_1$ | $T_2$ | Sig. | Control | G.M. | S.E./plot |
|---|---|---|---|---|---|
| 800 | 837 | N.S. | 471 | 795 | 169·8 |
| 1601 | 1840 | ** | 639 | 1648 | 218·7 |
| 1932 | 2290 | N.S. | 1502 | 2070 | 357·7 |
| 1496 | 1556 | ** | 1143 | 1500 | 321·1 |
| 1457 | 1630 | * | 939 | 1544 | 488·1 |

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**Crop :- Jowar** (*Kharif*). **Ref :- Ms. 62(84), 63(84).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'M'.**

Object :—To study the N, P and K requirements for Jowar.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton; *Jowar*—Groundnut and Wheat (1963). (b) Cotton; Groundnut and Wheat (1963). (c) Nil. (ii) Medium black. (iii) 21.7.62; 12.7.63. (iv) (a) Harrowing. (b) Drilled. (c) 4 Kg/ha. (d) 46 cm.×15 to 20 cm. (e) N.A. (v) Nil. (vi) *Nandyal* (medium). (vii) Unirrigated. (viii) Nil. (ix) 56 cm.; 39 cm. (x) 26.12.62; 7.12.63.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S : $N_0=0$, $N_1=22{\cdot}4$ and $N_2=44{\cdot}8$ Kg/ha.
(2) 3 levels of $P_2O_5$ as Super ; $P_0=0$, $P_1=11{\cdot}2$ and $P_2=22{\cdot}4$ Kg/ha.
(3) 3 levels of $K_2O$ as Mur. Pot. : $K_0=0$, $K_1=11{\cdot}2$ and $K_2=22{\cdot}4$ Kg/ha.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 8·2 m.×7·3 m. (b) 7·3 m.×6·4 m. (v) 46 cm.×46 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962—N.A. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous. Treatments × years interaction is absent.

5. RESULTS :

62(84)

(i) 2354 Kg/ha. (ii) 181·5 Kg/ha. (iii) Main effect of N is highly significant. Interaction N×P is significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 2097 | 2193 | 2043 | 2195 | 2109 | 2029 | 2111 |
| $N_1$ | 2340 | 2321 | 2502 | 2408 | 2392 | 2363 | 2388 |
| $N_2$ | 2667 | 2658 | 2366 | 2525 | 2686 | 2480 | 2564 |
| Mean | 2368 | 2391 | 2304 | 2376 | 2396 | 2291 | 2354 |
| $K_0$ | 2323 | 2396 | 2409 | | | | |
| $K_1$ | 2507 | 2494 | 2186 | | | | |
| $K_2$ | 2274 | 2282 | 2317 | | | | |

C.D. for N marginal means =125·5 Kg/ha.
C.D. for the body of N×P table=217·3 Kg/ha.

63(84)

(i) 2377 Kg/ha. (ii) 285·0 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 2050 | 2057 | 1970 | 2095 | 2169 | 1814 | 2026 |
| $N_1$ | 2244 | 2657 | 2380 | 2416 | 2347 | 2519 | 2427 |
| $N_2$ | 2558 | 2664 | 2812 | 2735 | 2651 | 2647 | 2678 |
| Mean | 2284 | 2459 | 2387 | 2415 | 2389 | 2327 | 2377 |
| $K_0$ | 2151 | 2617 | 2476 | | | | |
| $K_1$ | 2379 | 2452 | 2336 | | | | |
| $K_2$ | 2322 | 2308 | 2350 | | | | |

C.D. for N marginal means=197·1 Kg/ha.

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**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 61(267), 62(276), 63(231).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'M'.**

Object :—To study the effect of Mg. Phos. vs. Super on *Jowar*.

1. BASAL CONDITIONS :

(i) (a) Wheat *Jowar*. (b) Wheat. (c) N.A. (ii) Black soil. (iii) 23.7.63 ; 28.7.62; 18.7.63. (iv) (a) Ploughing and harrowing. (b) Drilled. (c) 4·5 Kg/ha. (d) 61 cm. × 15 cm. (1961, 62); 46 cm. between rows (1963). (e) 2. (v) 12·4 C.L./ha. of F.Y.M. (vi) *Nandyal*. (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 35 cm.; 41 cm.; 34 cm. (x) 23.12.61 ; 28.12.62; 18.12.63.

2. TREATMENTS :

All combinations of (1) and (2)+a control (no manure)

(1) 2 levels of $P_2O_5$ : $P_1$=16 8 and $P_2$=22·4 Kg/ha.

(2) 2 sources of $P_2O_5$ : $S_1$= Super and $S_2$=Mg. Phos.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 5. (b) N.A. (iii) 5, 6, 6. (iv) (a) 10·4 m.×4·9 m. ; 8·2 m.×6·4 m. in 62 and 63. (b) 9·1 m.×3·7 m.; 7·3 m.×5·5 m. in 62 and 63. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. ; Nil in 1962 and 63. (iii) Yield of grain. (iv) (a) 1961—'63. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous. Treatments×years interaction is absent.

5. RESULTS :

**61(267)**

(i) 2171 Kg/ha. (ii) 383·8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=2081 Kg/ha.

| | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $P_1$ | 2136 | 2232 | 2184 |
| $P_2$ | 2160 | 2249 | 2204 |
| Mean | 2148 | 2240 | 2194 |

**62(276)**

(i) 2167 Kg/ha. (ii) 148·5 Kg/ha: (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=2235 Kg/ha.

| | $S_1$ | $S_2$ | Mea |
|---|---|---|---|
| $P_1$ | 2042 | 2107 | 2075 |
| $P_2$ | 2241 | 2208 | 2225 |
| Mean | 2142 | 2158 | 2150 |

**63(231)**

(i) 1357 Kg/ha. (ii) 161·2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Contral=1397 Kg/ha.

| | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $P_1$ | 1364 | 1233 | 1298 |
| $P_2$ | 1444 | 1345 | 1394 |
| Mean | 1404 | 1289 | 1346 |

**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 64(83).**

**Site :- Agri. College Farm, Dharwar.** **Type :- 'M'.**

Object :—To find out suitable placement method and kind of fertiliser for application to Jowar in black soil.

1. BASAL CONDITIONS :

(i) (a) Cotton+Chlily –*Jowar*. (b) Cotton+Chilly. (c) Nil. (ii) Black soil. (iii) 21.7.64. (iv) (a) Harrowing. (b) Dibbling. (c) N.A. (d) 38 cm.×30 cm. (e) 2. (v) 32·1 Kg/ha. of $P_2O_5$ as Super. (vi) *Nandyal* (late). (vii) Unirrigated. (viii) Interculturing and weeding. (ix) 77 cm. (x) 23.12.64.

2. TBEATMENTS :

All combinations of (1) and (2) with 13 Kg/ha. of $P_2O_5$+a control

(1) 4 sources of N at 18 Kg/ha. : $S_1$=A/S, $S_2$=Urea, $S_3$=C/A/N and $S_4$=A/S/N.

(2) 4 methods of placement : $M_1$=10 cm. deep and 30 cm. apart before sowing, $M_2$=13 cm. deep by plough sole method a week before sowing (for P), $\frac{1}{2}$ N by seed-cum-fertilizer drill at sowing and $\frac{1}{2}$ N as top dressing 5 weeks after sowing, $M_3$= $\frac{1}{2}$ (N+P) by seed-cum-fertilizer drill at sowing and $\frac{1}{2}$ by top dressing drill 5 cm. away and 5 cm. deep 5 weeks after sowing and $M_4$=3/4 (N+P) 5 cm. away and 5 cm. deep from seed line and remaining 8 cm. to 10 cm. deep between the lines by plough sole.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 17. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×6·1 m. (b) 8·2 m.×5·3 m. (v) 46 cm.× 38 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain and straw yield. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 395 Kg/ha. (ii) 65·7 Kg/ha. (iii) Main effect of M, interaction S×M and 'control *vs.* others' are highly significant (iv) Av. yield of grain Kg/ha.

Control=256 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $S_1$ | 545 | 310 | 467 | 421 | 436 |
| $S_2$ | 392 | 274 | 442 | 410 | 379 |
| $S_3$ | 441 | 321 | 421 | 395 | 395 |
| $S_4$ | 303 | 505 | 437 | 380 | 406 |
| Mean | 420 | 353 | 442 | 401 | 404 |

C.D. for M marginal means =46·7 Kg/ha.
C.D. for control *vs.* others =95·7 Kg/ha.
C.D. for body of S×M table=93·4 Kg/ha.

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**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 64(84).**

**Site :- Agril. College Farm, Dharwar.** **Type :- 'M'.**

Object :—To find out the effect of different placement methods of different kinds of fertilizers on *Jowar* in red soil.

1. BASAL CONDITIONS :

(i) (a) Chilly+Cotton—*Jowar*. (b) Chilly+Cotton. (c) Nil. (ii) Red sandy loam. (iii) 18.7.64. (iv) (a) 2 harrowings. (b) Dibbling. (c) N.A. (d) 46 cm. × 30 cm. (e) 2. (v) 32·1 Kg/ha. of $P_2O_5$. (vi) *Nandyal* (late). (vii) Unirrigated. (viii) Interculturing and weeding. (ix) 77 cm. (x) Dec., 64.

2. TREATMENTS ;

Same as in expt. no. 64(83) on page 184.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 17. (b) N.A. (iii) 4. (iv) (a) 8·2 m. × 5·5 m. (b) 7·3 m. × 4·6 m. (v) 46 cm. × 46 cm. (vi) Yes.

4. GENERAL :

(i) Crop was seriously affected due to water logging and yields were extremely low. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 72 Kg/ha. (ii) 40·4 Kg/ha. (iii) Main effect of M is highly significant and 'control *vs.* others' is significant. (iv) Av. yield of grain in Kg/ha.

Control=32 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $S_1$ | 87 | 48 | 87 | 101 | 81 |
| $S_2$ | 64 | 41 | 83 | 48 | 59 |
| $S_3$ | 54 | 49 | 79 | 112 | 73 |
| $S_4$ | 77 | 51 | 67 | 153 | 87 |
| Mean | 71 | 47 | 79 | 103 | 75 |

C.D. for M marginal means=28·8 Kg/ha.
C.D. for control *vs.* others =59·3 Kg/ha.

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**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 61(48), 62(36).**

**Site :- Agri. Res. Stn., Gangavathy.** **Type :- 'M'.**

Object :—To find out the optimum dose of organic manure for Jowar.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*. (b) Cotton. (c) Nil. (ii) Light black soil. (iii) 26.6.61; 10.6.62. (iv) (a) 2 ploughings and 2 to 4 harrowings. (b) Drilling. (c) 7 Kg/ha. (d) 38 cm. between rows. (e) —. (v) Nil. (vi) D—340. (vii) Irrigated. (viii) 1 to 3 hoeings and 4 hand weedings. (ix) 36 cm.; 54 cm. (x) 25, 26.11.61; 10.11.62.

2. TREATMENTS :

8 manurial treatments : $T_0$=Control (no manure), $T_1$=F.Y.M. only, $T_2$=Top dressing only (details N.A.), $T_3=T_1+T_2$, $T_4$=N, P and K equivalent of F.Y.M., $T_5=T_2+T_4$, $T_6=\frac{1}{2}$ F.Y.M.+$\frac{1}{2}$ F.Y.M. equivalent+top dressing and $T_7=\frac{1}{4}$ F.Y.M.+3/4 F.Y.M. equivalent+top dressing.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 1/198 ha. (b) 1/247 ha. (v) 6 cm. on either side. (vi) Yes.

4. GENERAL :

(i) Crop was damaged partially in 1962 and normal in '61. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961-62. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) 30 to 40% of the crop damaged due to heavy rains in 1962. Error variances are heterogeneous. Treatments×years interaction is present.

5. RESULTS :

(i) 1658 Kg/ha. (ii) 576·1 Kg/ha. (based on 7 d.f. made up of Treatments×years interaction). (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 999 | 1176 | 1512 | 1567 | 1747 | 2180 | 1793 | 2290 |

C.D.=887·5 Kg/ha.

| Years | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1961 | 429 | 375 | 894 | 1031 | 776 | 1188 | 1058 | 1370 | ** | 890 | 203·1 |
| 1962 | 1569 | 1977 | 2130 | 2103 | 2718 | 3173 | 2528 | 3210 | ** | 2426 | 376·1 |
| Pooled | 999 | 1176 | 1512 | 1567 | 1747 | 2180 | 1793 | 2290 | * | 1658 | 576·1 |

**Crop :- Jowar** (*Kharif*). **Ref :- 61(49), 62(35).**

**Site :- Agri. Res. Stn., Gangavathy.** **Type :- 'M'.**

Object :—To study the comparative effects of Mg. Phos. vs. Super on Jowar.

1. BASAL CONDITIONS ;

(i) (a) Cotton—*Jowar*. (b) Cotton. (c) 24·7 C.L./ha. of F.Y.M.+22·4 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$ (1961); 12·4 C.L./ha. of F.Y.M.+224 Kg/ha. of A/S+140 Kg/ha. of Super (1962). (iii) Light black soil. (iii) 26.6.61 ; 10.6.62. (iv) (a) 2 ploughings and 4 harrowings. (b) Dibbling. (c) 7 Kg/ha. (d) 38 cm. between rows. (e) —. (v) 24·7 C.L./ha. of F.Y.M.+44·8 Kg/ha. of N (½ N as basal dose+½ N after 45 days) in 1961 and 12·4 C.L./ha. of F.Y.M.+44·8 Kg/ha. of N as A/S in 1962. (vi) D—340 (medium). (vii) Irrigated. (viii) 1 hand weeding and 1 to 3 interculturings. (ix) 36 cm.; 54 cm. (x) 25, 26.11.1961; 8.11.62.

2. TREATMENTS :

All combinations of (1) and (2)+a control (no manure)
(1) 2 levels of $P_2O_5$ ; $P_1$=22·4 and $P_2$=33·6 Kg/ha.
(2) 2 sources of $P_2O_5$ : $S_1$=Super and $S_2$=Mg. Phos.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 5. (b) 22·9 m.×11·1 m.; 22·9 m.×9·2 m. (iii) 6. (iv) (a) 1/198 ha. (b) 1/247 ha. (v) 1 row on either side and 76 cm. lengthwise on both sides in 1961 and 1 row on either side in 1962. (vi) Yes.

4. GENERAL :

(i) Normal; Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1961—62. (b) No. (c) As under 5. Results. (v) Sirugappa. (vi) Nil. (vii) 30 to 40 percent of the crop damaged due to heavy rains in Oct. 1962. Error variances are homogeneous. Treatments×years interaction is absent.

5. RESULTS ;

(i) 2183 Kg/ha. (ii) 544·2 Kg/ha. (based on 44 d.f. made up of pooled error and Treatments×years interaction). (iii) Control *vs.* others effect and S effect are highly significant. (iv) Av. yield of grain in Kg/ha.

Control=1291 Kg/ha.

|  | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $P_1$ | 2743 | 2085 | 2414 |
| $P_2$ | 2721 | 2074 | 2398 |
| Mean | 2732 | 2080 | 2406 |

C.D. for 'control *vs.* others' means=354·2 Kg/ha.
C.D. for S marginal means =316·9 Kg/ha.

| Years | $P_1$ | $P_2$ | Sig. | $S_1$ | $S_2$ | Sig. | Control | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|
| 1961 | 1684 | 1782 | N.S. | 1966 | 1500 | * | 1055 | 1597 | 495·1 |
| 1962 | 3130 | 3012 | N.S. | 3498 | 2644 | * | 1527 | 2762 | 533·9 |
| Pooled | 2414 | 2398 | N.S. | 2732 | 2080 | * | 1291 | 2183 | 544·2 |

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**Crop :- Jowar (*Rabi*).** **Ref :- Ms. 62(262).**

**Site :- Agril. Res. Stn., Haqari.** **Type :- 'M'.**

Object :—To find out the relative merits of fused Mg. Phos. vs. Single Super at different levels on *Rabi* Jowar.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*. (b) Cotton. (c) Nil. (ii) Black Cotton soil. (iii) 19.10.62. (iv) (a) Ploughing and levelling. (b) Dibbling. (c) to (e) N.A. (v) 12 C.L./ha. F.Y.M.+22·4 Kg/ha. of N. (vi) M. 47—3. (vii) Unirrigated. (viii) Weeding. (ix) 30 cm. (x) 12.3.63.

2. TREATMENTS :

Same as in expt. nos. 61(267). 62(276), 63(231) on page 182.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 1/247 ha. (v) 1 row on either side of each plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Weight of grain and straw. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 90 Kg/ha. (ii) 31·9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=75 Kg/ha.

|  | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $P_1$ | 92 | 122 | 107 |
| $P_2$ | 89 | 70 | 80 |
| Mean | 90 | 96 | 93 |

**Crop :- Jowar (*Rabi*).** **Ref :- Ms. 63(223).**

**Site :- Agri. Res. Stn., Hagari.** **Type :- 'M'.**

Object :—To find out the relative merits of fused Mg. Phos. vs. Single Super under dry conditions.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*. (b) Cotton. (c) Nil. (ii) Black Cotton soil. (iii) 3.10.63. (iv) (a) Ploughing and levelling. (b) Dibbling. (c) to (e) N.A. (v) 12 C.L./ha. of F.Y.M.+22·4 Kg/ha. of N. (vi) M—47-3. (vii) Unirrigated. (viii) Weeding. (ix) N.A. (x) 20.2.64.

2. TREATMENTS :

All combinations of (1) and (2)+a control (no manure)

(1) 2 levels of $P_2O_5$ : $P_1$=22·4 and $P_2$=33·6 Kg/ha.

(2) 2 sources of $P_2O_5$ ; $S_1$=Super and $S_2$=Mg. Phos.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 1/247 ha. (v) One row on either side of each plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Weight of grain and straw. (iv) (a) 1962-63 (Treatments modified in 1963). (b) No. (s) Nil. (v) to (vii) Nii.

5. RESULTS :

(i) 933 Kg/ha. (ii) 40·6 Kg/ha. (iii) Main effects of S, P and control vs. others are highly significant. Interaction S×P is significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $P_1$ | 917 | 783 | 850 |
| $P_2$ | 989 | 897 | 943 |
| Mean | 953 | 840 | 896 |

C.D. for S or P marginal means=34·6 Kg/ha.

C.D. for control vs. others =38·7 Kg/ha.

C.D. for body of S×P table =48·9 Kg/ha.

—=—

**Crop :- Jowar (*Rabi*).** **Ref :- Ms. 62(121), 63(109).**

**Site :- Agri. Res. Stn., Naragund.** **Type :- 'M'.**

Object :—To find out how far sand will prove useful in improving karl soils of this tract.

1. BASAL CONDITIONS :

(i) (a) Cotton—Wheat—Jowar. (b) Wheat. (c) Nil. (ii) Karl soil—highly alkaline. (iii) 11.11.1962 ; 1.11.1963. (iv) (a) 3 harrowings by blade harrow. (b) and (c) N.A. (d) 46 cm. between rows. (e) —. (v) Nil. (vi) M 35-1 (medium). (vii) Unirrigated. (viii) Interculturing by hoe. (ix) N.A. (x) 25.3.1963 ; 25.3.1964.

2. TREATMENTS :

4 levels of sand : $L_0$=Control, $L_1$=100·4, $L_2$=150·6 and $L_3$=200·9 Kg/ha.

Time and method of application of sand N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 7.3 m.×11·0 m. (b) 6·4 m.×10·1 m. (v) 46 cm.×46 cm. (vi) Yes.

4. GENERAL :

(i) 20% crop lodged due to heavy rains and winds in 1962. 80% crop lodged due to heavy winds on 12, 13.2.1964 ; Normal. (ii) Stem borer and sugary disease in earlier stages. Affected plants were uprooted and burnt. (iii) Plant count and grain yield. (iv) (a) 1961—64 (expt. failed in 1961 and treatments are modified in 1964). (b) Yes. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous Treatments×years interaction is absent.

5. RESULTS :

(i) 373 Kg/ha. (ii) 94·8 Kg/ha. [based on 33 d.f. made up of pooled error and Treatments×years interaction]. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $L_0$ | $L_1$ | $L_2$ | $L_3$ |
|---|---|---|---|---|
| Av. yield | 371 | 386 | 344 | 390 |

| Years | $L_0$ | $L_1$ | $L_2$ | $L_3$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|
| 1962 | 371 | 354 | 305 | 393 | N.S. | 356 | 100·2 |
| 1963 | 371 | 419 | 382 | 386 | N.S. | 390 | 92·7 |
| Pooled | 371 | 386 | 344 | 390 | N.S. | 373 | 94·8 |

**Crop :- Jowar (*Rabi*).** **Ref :- Ms. 64(93).**

**Site :- Agri. Res. Stn., Naragund.** **Type :- 'M'.**

Object :—To find out how far sand will prove useful to a mechanical means in improving karl soils.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) N.A. (ii) Alkaline. (iii) 5.11. 64. (iv) (a) Harrowing by country blade harrow. (b) Dibbling. (c) 9 Kg/ha. (d) 46 cm.×46 cm. (e) N.A. (v) Nil. (vi) M 35-1 (medium). (vii) Unirrigated. (viii) Interculturing by hoe. (ix) 108 cm. (x) 9.3.65.

2. TREATMENTS :

4 levels of sand : $L_0$=Control, $L_1$=251·1, $L_2$=502·2 and $L_3$=753·3 Q/ha.

3. DESIGN :

(i) R.B.D, (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 11·0 m.×7·3 m. (b) 10·1 m.×6·4 m. (v) 46 cm.×46 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Slight attack of grass hopper was controlled bp B.H.C., Gammaxine Mixture and Folidol (iii) Plant count, height and grain yield. (iv) (a) 1961—64 (modified in 1964). (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 834 Kg/ha. (ii) 127·7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha .

| Treatment | $L_0$ | $L_1$ | $L_2$ | $L_3$ |
|---|---|---|---|---|
| Av. yield | 751 | 871 | 872 | 841 |

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**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 62(264), 64(188).**

**Site :- Agri. Res. Stn., Raichur.** **Type :- :M'.**

Object :—To compare the effect of Mg. Phos. with Super on the yield of *Jowar*.

1 BASAL CONDITIONS

(i) (a) to (c) Nil. (ii) Red soil. (iii) N.A. (iv) (a) Ploughings and 4 to 5 harrowings. (b) Drilling. (c) 5. Kg/ha. (d) 46 cm. between rows. (e) —. (v) 12·4 C.L./ha. of F.Y.M. (vi) D—340. (vii) Unirrigated (viii) 2 weedings and 2 interculturings. (ix) 84 cm.; 89 cm. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)+a control (no manure)
(1) 2 levels of $P_2O_5$ : $L_1$=16·8 and $L_2$=22·4 Kg/ha.
(2) 2 sources of $P_2O_5$ : $P_1$=Super and $P_2$=Mg. Phos.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 3·6 m.×15·2 m. (b) 1/247 ha. (v) 3 rows. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1962–64. (b) No. (c) As under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous. Treatments×years interaction is absent. Experiment for 1961, 1963 N.A.

5. RESULTS :

62(264)

(i) 1912 Kg/ha. (ii) 579 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=1907 Kg/ha.

|  | $P_1$ | $P_2$ | Mean |
|---|---|---|---|
| $L_1$ | 1951 | 1824 | 1888 |
| $L_2$ | 1689 | 2191 | 1940 |
| Mean | 1820 | 2008 | 1914 |

64(188)

(i) 405 Kg/ha. (ii) 153·8 Kg/ha. (iii) Only control *vs.* others is highly significant. (iv) Av. yield of grain in Kg/ha.

Control=196 Kg/ha.

|  | $P_1$ | $P_2$ | Mean |
|---|---|---|---|
| $L_1$ | 444 | 442 | 443 |
| $L_2$ | 549 | 393 | 471 |
| Mean | 496 | 418 | 457 |

C.D. for control *vs.* others=146·4 Kg/ha.

**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 63(224).**

**Site :- Agri. Res. Stn., Raichur.** **Type :- 'M'.**

Object :—To study the role of F.Y.M. on the yield of *Jowar* in red soil under rainfed condition.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Red soil. (iii) N.A. (iv) (a) 2 wooden ploughings ; 3 to 4 harrowings. (b) Drilling. (c) 5 Kg/ha. (d) 46 cm. between rows. (e) —. (v) Nil. (vi) D—3—40. (vii) Unirrigated. (viii) 2 weedings and 2 interculturings. (ix) 64 cm. (x) N.A.

2. TREATMENTS :

8 manurial treatments : $T_0$=Top dressing only, $T_1$=12·4 C.L./ha. of F.Y.M., $T_2=T_0+T_1$, $T_3$=F.Y.M. equivalent, $T_4=T_3+T_0$, $T_5$=9·3 C.L./ha. of F.Y.M.+¼ F.Y.M. equivalent+top dressing, $T_6$=6·2 C.L /ha. of F.Y.M.+½ F.Y.M. equivalent+top dressing and $T_7$=3·1 C.L./ha. of F.Y.M.+3/4 F.Y.M. equivalent+top dressing.

Other details N.A.

3. DESIGN -

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) and (b) 5·5 m.×13·7 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield/plot. (iv) (a) 1962—only. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 961·1 Kg/ha. (ii) 260·7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 888 | 928 | 924 | 836 | 966 | 1265 | 1003 | 878 |

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**Crop :- Jowar (*Rabi*).** **Ref :- Ms. 65(19).**

**Site :- Agri. Res. Stn., Raichur.** **Type :- 'M'.**

Object :—To study the effect of N and P fertilisers on the yield of *Rabi* Jowar.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Red soil. (iii) N.A. (iv) (a) Ploughing and 4 to 5 harrowing. (b) Drilling. (c) 5 Kg/ha. (d) 46 cm. between rows. (e) —. (v) 12·4 C.L./ha. of F.Y.M.+22·4 Kg/ha. of $K_2O_5$ as Mur. Pot. applied uniformly. (vi) M. 35—1. (vii) Unirrigated. (viii) 2 weedings and 2 interculturings. (ix) 30 cm. (x) 14.2.66.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 5 levels of N : $N_0$=0, $N_1$=22·4, $N_2$=44·8, $N_3$=67·2 and $N_4$=89·6 Kg/ha.
(2) 5 levels of $P_2O_5$ : $P_0$=0, $P_1$=11·2, $P_2$=22·4, $P_3$=33·6 and $P_4$=44·8 Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 25. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 4·6 m.×7·3 m. (v) 2 rows. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1965—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 445 Kg/ha. (ii) 194·1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $N_4$ | Mean |
|---|---|---|---|---|---|---|
| $P_0$ | 453 | 336 | 731 | 463 | 284 | 453 |
| $P_1$ | 260 | 423 | 658 | 318 | 413 | 414 |
| $P_2$ | 414 | 501 | 348 | 401 | 389 | 411 |
| $P_3$ | 269 | 420 | 553 | 456 | 456 | 431 |
| $P_4$ | 605 | 433 | 523 | 393 | 620 | 515 |
| Mean | 400 | 423 | 563 | 406 | 432 | 445 |

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**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 63(227).**

**Site :- Agri. Res. Stn., Raichur.** **Type :- 'M'.**

Object : To study the residual effect of fertilizers applied to Groundnut during 1962—63 on *Kharif* Jowar.

1. BASAL CONDITIONS :

(i) (a) Groundnut—*Jowar*. (b) Groundnut. (c) As per treatments. (ii) Red soil (iii) 30.6.63. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) 6·7 Kg/ha. (d) and (e) N.A. (v) 12·4 C.L./ha. of F.Y.M. (vi) D—3—40. (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 64 cm. (x) 16.12.63.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 2 levels of N as A/S : $N_1$=11·2 and $N_2$=22·4 Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_1$=16·8, $P_2$=33·6 and $P_3$=50 4 Kg/ha.
(3) 2 levels of $K_2O$ as Mur. Pot. : $K_0$=0 and $K_1$=22·4 Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 4·6 m.×7·6 m. (v) 91 cm. alround. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) and (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 242 Kg/ha. (ii) 116·4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $P_1$ | $P_2$ | $P_3$ | $K_0$ | $K_1$ | Mean |
|---|---|---|---|---|---|---|
| $N_0$ | 368 | 270 | 198 | 284 | 274 | 279 |
| $N_1$ | 174 | 182 | 258 | 204 | 206 | 205 |
| Mean | 271 | 226 | 228 | 244 | 240 | 242 |
| $K_0$ | 252 | 230 | 250 | | | |
| $K_1$ | 290 | 222 | 207 | | | |

**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 60(107).**

**Site :- Agri. Res. Stn., Saundathi.** **Type :- 'M'.**

Object :—To assess the value of 'complesal' a high grade German fertilizer mixture.

### 1. BASAL CONDITIONS :

(i) (a) *Jowar* Groundnut. (b) Groundnut. (c) Nil. (ii) Medium black. (iii) 11.7.60. (iv) (a) 3 harrowings. (b) Sown by drill. (c) 7 Kg/ha. (d) 30 cm.×10 to 15 cm. (e) N.A. (v) 7·4 C.L./ha. of F.Y.M. applied by spreading on 5.6.1960. (vi) Fulgar white (improved). (vii) Unirrigated. (viii) 2 interculturings with hoe and 1 hand weeding. (ix) 44 cm. (x) 23.12.60.

### 2. TREATMENTS :

8 manurial treatments : $M_0$=Control (No manure), $M_1$=168·1 Kg/ha. of complesal at sowing, $M_2$=168·1 Kg/ha. of complesal ($\frac{1}{2}$ at sowing+$\frac{1}{2}$ after one month), $M_3$=168·1 Kg/ha. of A/S at sowing, $M_4$=168·1 Kg/ha. of A/S ($\frac{1}{2}$ at sowing+$\frac{1}{2}$ after one month), $M_5$=84·1 Kg/ha. of A/S at sowing, $M_6$=$M_5$+84·1 Kg/ha. of C/A/N after one month and $M_7$=168·1 Kg/ha. of A/S ($\frac{1}{2}$ at sowing and $\frac{1}{2}$ at one month after sowing).

### 3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) 142·7 m.×8·2 m. (iii) 4. (iv) (a) 17·8 m.×8·2 m. (b) 16·0 m.×6·4 m. (v) 91 cm. ×91 cm. (vi) Yes.

### 4. GENERAL :

(i) Satisfactory. (ii) There was attack of grass hoppers. B.H.C. 10% was dusted at 22·4 Kg/ha. (iii) Grain yield. (iv) (a) 1958 to 60. (b) No. (c) Nil. (v) Dharwar, Bailhongal, Raichur and Dodesagar. (vi) and (vii) Nil.

### 5. RESULTS ;

(i) 1681 Kg/ha. (ii) 225·4 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 1146 | 1681 | 1758 | 1824 | 1687 | 1784 | 1637 | 1931 |

C.D.=331·6 Kg/ha.

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**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 60(110), 61(83), 62(88), 63(78), 64(58), 65(97).**

**Site :- Agri. Res. Stn., Saundathi.** **Type :- 'M'.**

Object :—To study the possibility of reducing the dosage of organic manures and or replacing it by inorganic manures under dry farming conditions.

### . BASAL CONDITIONS :

(i) (a) *Jowar*—Groundnut. (b) Groundnut. (c) Nil. (ii) Medium black. (iii) 19.7.1960; 21.7.61; 19.7.62; 18.7.63; 10.7.64; 29.7.65. (iv) (a) 2 harrowings. (b) Drilling. (c) 7 Kg/ha. (d) 30 cm.×10 to 15 cm. (e) Nil. (v) Nil. (vi) Fulgar white. (vii) Unirrigated. (viii) 2 to 3 interculturings with hoe and 2 hand weedings. (ix) 44 cm.; 28 cm.; 47 cm.; 33 cm.; 55 cm. and 48 cm. (x) 25.12.60; 30.12.61; 6.1.63; 18.12.63 15.12 64 and 6.12.65.

### 2. TREATMENTS :

9 manurial treatments : $T_0$=Control (2 plots/block), $T_1$=2800 Kg/ha. of F.Y.M., $T_2$=5600 Kg/ha. of F.Y.M., $T_3$=Equivalent quantities of N, P and K present in $T_1$ (N as A/S), $T_4$ =As $T_3$ (N as Urea), $T_5$=Equivalent quantities of N, P and K present in $T_2$ (N as A/S), $T_6$=As $T_5$ (N as Urea), $T_7$=$T_1$+$T_3$ and $T_8$=$T_1$+$T_4$.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) 45·7 m.×14·6 m. (iii) 4. (iv) (a) 9·1 m.×7·3 m. (b) 7·3 m.×5·5 m. (v) 91 cm. ×91 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Crop affected by sugary disease and no control measure was taken in 1960. Grass hopper attack, 22·4 Kg/ha. of B.H.C. 10% was dusted in 1960 to '62. Attack by stem borer, army worms in 61, 62, 64; Nil in 63, 65. (iii) Grain yield. (iv) (a) 1960—66. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

60(110)

(i) 915 Kg/ha. (ii) 195·9 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 376 | 418 | 786 | 1010 | 1038 | 1307 | 1389 | 12[illegible]8 | 1183 |

C.D. for the comparison of $T_0$ *vs.* others =246·2 Kg/ha.
C.D. for comparison of any 2 treatment means except $T_0$=284 2 Kg/ha.

61(83)

(i) 1555 Kg/ha. (ii) 229·7 Kg/ha. (iii) Treatment differences are significant and control *vs.* others is highly significant, (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 1149 | 1287 | 1448 | 1676 | 1773 | 1894 | 1833 | 1778 | 1565 |

C.D. for comparison of $T_0$ *vs.* others =288·6 Kg/ha.
C.D. for comparison of any 2 treatment means except $T_0$=333·3 Kg/ha.

62(88)

(i) 751 Kg/ha. (ii) 178 7 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 307 | 466 | 758 | 850 | 867 | 853 | 969 | 1023 | 1114 |

C.D. for comparison of $T_0$ *vs.* others =224·6 Kg/ha.
C.D. for comparison of any 2 treatment means except $T_0$=259·3 Kg/ha.

63(78)

(i) 1555 Kg/ha. (ii) 229·7 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 1149 | 1281 | 1448 | 1676 | 1773 | 1894 | 1833 | 1778 | 1565 |

C.D. for comparison of $T_0$ *vs.* others =288·6 Kg/ha.
C.D. for comparison of any 2 treatment means except $T_0$=333·3 Kg/ha.

64(58)

(i) 859 Kg/ha. (ii) 197·5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 340 | 634 | 827 | 770 | 896 | 1144 | 1188 | 1129 | 1324 |

C.D. for comparison of $T_0$ *vs.* others =248·2 Kg/ha.
C.D. for comparison of any 2 treatment means except $T_0$=286·5 Kg/ha.

65(97)

(i) 1175 Kg/ha. (ii) 162·7 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 852 | 986 | 1076 | 1166 | 1076 | 1435 | 1345 | 1524 | 1435 |

C.D. for comparison of $T_0$ *vs.* any others =204·4 Kg/ha.
C.D. for comparison of any 2 treatment means except $T_0$=236·1 Kg/ha.

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**Crop :- Jowar** (*Kharif*). **Ref :- Ms. 61(87), 62(89), 63(88), 64(61).**
**Site :- Agri. Res. Stn., Saundathi.** **Type :- 'M'.**

Object :—To compare the effect of Mg. Phos. (fused) with Super. at different levels.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Groundnut. (b) Groundnut. (c) 22·4 Kg/ha. of Super. (ii) Medium black. (iii) 21.7.61; 15.7.62; 7.7.63; 11.7.64. (iv) (a) 3 harrowings. (b) Drilling. (c) 4 Kg/ha. (d) 46 cm.×10 to 15 cm. (e) Nil. (v) 12·4 C.L./ha. of F.Y.M. applied 2 to 4 weeks before sowing+22·4 Kg/ha. of N as A/S applied at sowing by combined drill. (vi) Fulgar white. (vii) Unirrigated. (viii) 3 interculturings with hoe and 2 weedings. (ix) 28 cm.; 48 cm.; 36 cm.; 55 cm. (x) 30.12.61; 5.1.63; 15.12.63; 12.12 64.

2. TREATMENTS :

All combinations of (1) and (2)+a control (no manure)

(1) 2 levels of $P_2O_5$ : $P_1$=16·8 and $P_2$=22·4 Kg/ha.
(2) 2 sources of $P_2O_5$ : $S_1$=Super and $S_2$=Mg. Phos.

3. DESIGN :

(i) Fact. in L. Sq. (ii) (a) 5. (b) 36·6 m.×34·3 m. (iii) 5. (iv) (a) 7·3 m.×6·9 m. (b) 5·5 m.×5·5 m. (v) 91 cm.×46 cm. (vi) Yes.

4. GENERAL : .

(i) Satisfactory. (ii) Attacked by army worms and grass hopper—10% B.H.C. dusted in 61 and 62. Nil for other years. (iii) Yield of grain. (iv) (a) 1962—64. (b) No. (c) As under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous. Treatments×years interaction is absent.

5. RESULTS :

(i) 1620 Kg/ha. (ii) 184·1 Kg/ha. (based on 76 d.f. made up of pooled error and Treatments×years interaction). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=1595 Kg/ha.

| | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $P_1$ | 1640 | 1613 | 1626 |
| $P_2$ | 1655 | 1595 | 1625 |
| Mean | 1648 | 1604 | 1626 |

| Years | $P_1$ | $P_2$ | Sig. | $S_1$ | $S_2$ | Sig. | Control | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|
| 1961 | 1707 | 1718 | N.S. | 1728 | 1698 | N.S. | 1731 | 1717 | 202·7 |
| 1962 | 1425 | 1428 | N.S. | 1482 | 1370 | N.S. | 1396 | 1420 | 169·9 |
| 1963 | 1451 | 1384 | N.S. | 1416 | 1420 | N.S. | 1479 | 1430 | 189·7 |
| 1964 | 1923 | 1968 | N.S. | 1964 | 1927 | N.S. | 1774 | 1912 | 203·2 |
| Pooled | 1626 | 1625 | N.S. | 1648 | 1604 | N.S. | 1595 | 1620 | 184·1 |

**Crop :- Jowar** (*Kharif*). **Ref :- Ms. 60(108), 61(81).**

**Site :- Agri. Res. Stn., Saundathi.** **Type :- 'M'.**

Object :—To study the time and placement of fertilizers on Jowar.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Groundnut. (b) Groundnut. (c) Nil. (ii) Medium black soil. (iii) 12.7.60; 7.7.61. (iv) (a) 3 harrowings. (b) Drill sowing. (c) 7 Kg/ha. (d) 30 cm. × 10 to 15 cm. (e) N.A. (v) 7·4 C.L./ha. of F.Y.M. 1 month before sowing. (vi) Fulgar white (late). (vii) Unirrigated. (viii) 3 interculturings with hoe and 2 hand weedings. (ix) 44 cm.; 36 cm. (x) 25.12.60; 30.12.61.

2. TREATMENTS :

8 methods of application of 33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super : $M_0$=Control (no manure), $M_1$=Drilled both ways (crosswise), $M_2$=Applied by draw tube 5 cm. below the surface at sowing, $M_3$=Applied by s.c.f. drill, $M_4$=½ dose by s.c.f. drill+½ dose by top dressing implement 1 month after sowing, $M_5$=Broadcast at sowing, $M_6$=Broadcast (½ dose at sowing+½ dose 1 month after sowing) and $M_7$=½ dose as broadcast at sowing+½ applied by draw tubes at sowing.

s.c.f. drill stands for seed-cum-fertilizer drill.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) 142·7 m. × 6·4 m. (iii) 5. (iv) (a) 17·8 m. × 6·4 m. (b) 16·0 m. × 4·6 m. (v) 91 cm. × 91 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of grass hoppers. B.H.C. 10% was dusted at 22·4 Kg/ha. (iii) Grain yield. (iv) (a) 1958—63. (b) No. (c) As under 5. Results. (v) Bailhongal, Dharwar, Dodesagar and Raichur. (vi) Nil. (vii) Experiments for 1958 and 59 were also considered while pooling. Error variances are homogeneous. Trertments × years interaction is absent.

5. RESULTS :

(i) 1676 Kg/ha. (ii) 216·7 Kg/ha. (based on 133 d.f. made up of pooled error and Treatments × years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 1302 | 1678 | 1697 | 1723 | 1852 | 1722 | 1690 | 1744 |

C.D.=135·6 Kg/ha.

| Years | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 1504 | 1939 | 1889 | 1944 | 2080 | 1909 | 1968 | 1968 | * | 1900 | 221·2 |
| 1961 | 1410 | 1649 | 1728 | 1724 | 1990 | 1846 | 1827 | 1820 | N.S. | 1749 | 273·8 |
| Pooled | 1302 | 1678 | 1697 | 1723 | 1852 | 1722 | 1690 | 1744 | ** | 1676 | 216·7 |

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**Crop :- Jowar** (*Kharif*). **Ref :- Ms. 60(109), 61(82).**

**Site :- Agri. Res. Stn., Saundathi.** **Type :- 'M'.**

Object :—To study the effect of different nitrogeneous fertilizers on the yield of *Jowar*.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Groundnut. (b) Groundnut. (c) Nil. (ii) Medium black soil. (iii) 11.7.60; 8.7.61. (iv) (a) 3 harrowings. (b) Drill sowing. (c) 7 Kg/ha. (d) 30 cm.×10 to 15 cm. (e) N.A. (v) 7·4 C.L./ha. of F.Y.M. in 1960; 7·4 C.L./ha. of F.Y.M. applied 1 month before sowing. (vi) Fulgar white (late). (vii) Unirrigated. (viii) 3 interculturings with hoe and 2 hand weedings. (ix) 44 cm.; 36 cm. (x) 26.12.60; 30.12.61.

2. TREATMENTS :

6 sources of N at 33·6 Kg/ha. : $S_0$=Control (No N), $S_1$=A/S, $S_2$=C/A/N, $S_3$=A/C, $S_4$=Urea and $S_5$=A/S/N.

22·4 Kg/ha. of $P_2O_5$ as Super applied at sowing with combined seed drill to all treatments. Control treatment i.e., $S_0$ had 2 plots.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) 142·7 m.×6·4 m. (iii) 4. (iv) (a) 14·6 m.×7·3 m. (b) 12·8 m.×5·5 m. (v) 91 cm. ×91 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Grass hoppers attack. B.H.C. 10% was dusted at 22·4 Kg/ha. (iii) Graid yield. (iv) (a) 1958—63. (b) No. (c) As under 5. Results. (v) Bailhongal, Dharwar, Dodesaugar and Raichur. (vi) Nil. (vii) Experiment for 1959 also considered for pooling. Error variances are homogeneous. Treatments ×years interaction is present.

5. RESULTS :

(i) 1478 Kg/ha. (ii) 371·3 Kg/ha. (based on 10 d.f. made up of Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1195 | 1568 | 1499 | 1564 | 1611 | 1433 |

| Years | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|
| 1960 | 1114 | 1608 | 1660 | 1846 | 1969 | 1439 | ** | 1536 | 205·4 |
| 1961 | 1464 | 1775 | 1450 | 1490 | 1537 | 1391 | N.S. | 1510 | 245·2 |
| Pooled | 1195 | 1568 | 1499 | 1564 | 1611 | 1433 | N.S. | 1478 | 371·3 |

**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 60(96).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'M'.**

Object :—To find out the time of application of N at different stages of growth for *Jowar*.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton—Wheat. (b) Wheat. (c) 125·5 Q/ha. of F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (ii) Deep black soil. (iii) N.A. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 11 Kg/ha. (d) 3 cm. × 23 cm. (e) N.A. (v) 125·5 Q/ha. of F.Y.M.+22 4 Kg/ha. of $P_2O_5$ as Super. (vi) CO—9 (110 days). (vii) Irrigated. (viii) 1 hand weeding. (ix) 49 cm. (x) 3 and 4.11.60.

2. TREATMENTS :

4 times of application of N at 44·8 Kg/ha. : $T_1$=At sowing, $T_2$=1 month after sowing, $T_3$=½ dose at sowing+½ dose after 1 month and $T_4$=½ dose 1 month after sowing+½ dose at flag leaf stage.

3. DESIGN :

(i) R.B D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 1/124 ha. (b) 1/247 ha. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—60. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 3245 Kg/ha. (ii) 463·3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 3302 | 3304 | 3227 | 3148 |

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**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 60(95), 61(258), 62(259).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'M'.**

Object :—To find out the optimum dose of N, P and K for the yield of *Jowar*.

1. BASAL CONDITIONS :

(i) (a) *Jowar* - Cotton. (b) Cotton. (c) N.A. (ii) Black clayey soil. (iii) 24.6.1960 ; N.A. ; N.A.(iv) (a) Ploughing and harrowing. (b) Dibbling. (c) 13 Kg/ha. (d) 28 cm. × 28 cm. ; 23 cm. × 23 cm. (e) 1. (v) 125·5 Q/ha. of F.Y.M. (vi) CO—9. (vii) Irrigated. (viii) Weeding and thinning. (ix) 49 cm. ; 36 cm. ; 15 cm. (x) 25.10.1960 ; N.A. ; N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N : $N_0$=0, $N_1$=33·6 and $N_2$=67·2 Kg/ha.
(2) 3 levels of $P_2O_5$ : $P_0$=0, $P_1$=33·6 and $P_2$=67·2 Kg/ha.
(3) 3 levels of $K_2O$ : $K_0$=0, $K_1$=33·6 and $K_2$=67·2 Kg/ha.

3. DESIGN :

(i) $3^3$ partially Confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A, (iii) 2. (iv) (a) 1/198 ha. (b) 1/247 ha. (v) and (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960 to 1962. (b) No. (c) As under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous. Treatments × years interaction is present.

5. RESULTS :

(i) 1584 Kg/ha. (ii) 331·9 Kg/ha, (based on 36 d.f. made up of interaction of years with (N, P, K, N×P, N×K and P×K). (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $P_0$ | 1385 | 1520 | 1674 | 1582 | 1509 | 1488 | 1526 |
| $P_1$ | 1485 | 1538 | 1857 | 1626 | 1665 | 1589 | 1626 |
| $P_2$ | 1420 | 1605 | 1774 | 1626 | 1526 | 1647 | 1600 |
| Mean | 1430 | 1554 | 1768 | 1611 | 1567 | 1575 | 1584 |
| $K_0$ | 1584 | 1579 | 1672 | | | | |
| $K_1$ | 1361 | 1547 | 1791 | | | | |
| $K_2$ | 1345 | 1537 | 1842 | | | | |

C.D. for N marginal means=129·7 Kg/ha.

| Years | $N_0$ | $N_1$ | $N_2$ | Sig. | $P_0$ | $P_1$ | $P_2$ | Sig. | $K_0$ | $K_1$ | $K_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 3022 | 2955 | 3096 | N.S. | 2928 | 3114 | 3031 | N.S. | 3103 | 2961 | 3009 | N.S. | 3024 | 434·3 |
| 1961 | 545 | 691 | 976 | ** | 675 | 687 | 850 | * | 730 | 753 | 729 | N.S. | 737 | 64·4 |
| 1962 | 724 | 1017 | 1233 | ** | 976 | 1080 | 919 | ** | 1002 | 987 | 986 | N.S. | 992 | 68·6 |
| Pooled | 1430 | 1554 | 1768 | ** | 1526 | 1626 | 1600 | N.S. | 1611 | 1567 | 1575 | N.S. | 1584 | 331·9 |

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**Crop :- Jowar** (*Kharif*). **Ref :- Ms. 61(256), 62(257), 63(39).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'M'.**

Object :—To compare Mg. Phos. with Super at different levels.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*. (b) Cotton. (c) 124 Q/ha. of F.Y.M.+44·8 Kg/ha. of N as A/S for 61(256) and 62(257) and 125·5 Q/ha. of F.Y.M.+44·8 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super for 63(39). (ii) Medium black. (iii) 29.6.61 ; 16.6.62 ; 6.7.63. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) 6·3 Kg/ha. for 61 and 62 ; 12 to 15 Kg/ha. for 63. (d) 31 cm.×22 cm. for 61 and 62 ; 30 cm.×15 cm. for 63. (e) N.A. (v) Same as in (i) (c). (vi) CO—9. (vii) Irrigated. (viii) Weeding and interculturing. (ix) 42 cm. ; 53 cm. ; 48 cm. (x) 25.10.61 ; 3.10.62 ; 31.10.63.

2. TREATMENTS :

All combinations of (1) and (2)+one control.
(1) 2 levels of $P_2O_5$ : $P_1$=22·4 and $P_2$=33·6 Kg/ha.
(2) 2 sources of $P_2O_5$ : $S_1$=Super and $S_2$=Mg. Phos.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 1/193. (b) 1/247. (v) N.A. (vi) Yes.

## 4. GENERAL:

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1961 to 1963. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous. Treatments × years interaction is absent.

## 5. RESULTS :

61(256)

(i) 2739 Kg/ha. (ii) 330·6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=2597 Kg/ha.

| | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $P_1$ | 2700 | 2821 | 2760 |
| $P_2$ | 2700 | 2877 | 2788 |
| Mean | 2700 | 2849 | 2774 |

62(257)

(i) 3029 Kg/ha. (ii) 137·4 Kg/ha. (iii) Main effect of S is significant. Control vs. others is highly significant. (iv) Av. yield of grain in Kg/ha.

Control=2810 Kg/ha.

| | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $P_1$ | 3248 | 2974 | 3111 |
| $P_2$ | 3128 | 2987 | 3058 |
| Mean | 3188 | 2980 | 3084 |

C.D. for S marginal means=159·6 Kg/ha.

C.D. for control vs. others=178·4 Kg/ha.

63(39)

(i) 1900 Kg/ha. (ii) 391·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control=1724 Kg/ha.

| | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $P_1$ | 1875 | 2022 | 1948 |
| $P_2$ | 1970 | 1910 | 1940 |
| Mean | 1922 | 1966 | 1944 |

**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 60 to 64(M.A.E.).**

**Site :- M.A.E. Centre, Gangavati.** **Type :- 'M'.**

Object :—Type II To study the effect of different levels of N, P and K with and without F.Y.M. on the yield of *Jowar*.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*—Groundnut. (b) Cotton. (c) As per treatments. (ii) Medium black. (iii) 21, 22 6.60; 14, 15.6.61; 11.6.62; 14.6.63; 15.6.64. (iv) (a) 2 ploughings and 5 harrowings. (b) By hand drill. (c) 9·0 Kg/ha. (d) 38 cm.×15 to 23 cm. (e) N.A. (v) N.A. (vi) D—340 (120 days). (vii) Irrigated. (viii) 2 weedings and 3 hoeings. (ix) N.A. (x) 5 to 21.11.60; 20 to 24.10.61; 7 to 9.11.62; 26.11.63 ; 25.10.64.

2. TREATMENTS:

All combinations of (1), (2), (3) and (4)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=22{\cdot}4$ and $N_2=44{\cdot}8$ Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_0=0$, $P_1=22{\cdot}4$ and $P_2=44{\cdot}8$ Kg/ha.
(3) 3 levels of $K_2O$ as Mur. Pot. : $K_0=0$, $K_1=22{\cdot}4$ and $K_2=44{\cdot}8$ Kg/ha.
(4) 2 levels of F.Y.M.: $F_0=0$ and $F_1=5600$ Kg/ha.

3. DESIGN :

(i) $3^3\times2$ Fact. confd. (ii) (a) 9 plots/block ; 6 blocks/replication. [3 blocks received $F_0$ and 3 blocks received $F_1$ treatments]. (b) N.A. (iii) 1. (iv) (a) 15·5 m.×6 7 m. (b) 13·4 m.×6·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1960—65. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

60(M.A.E.)

(i) 1498 Kg/ha. (ii) 300·2 Kg/ha. (iii) Main effect of N is highly significant and interaction P×K is significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 899 | 1624 | 2014 | 1513 | 1394 | 1630 | 1426 | 1620 | 1490 | 1512 |
| $F_1$ | 988 | 1441 | 2024 | 1311 | 1594 | 1547 | 1415 | 1626 | 1411 | 1484 |
| Mean | 943 | 1532 | 2019 | 1412 | 1494 | 1588 | 1420 | 1623 | 1450 | 1498 |
| $K_0$ | 905 | 1560 | 1795 | 1166 | 1588 | 1506 | | | | |
| $K_1$ | 1041 | 1752 | 2076 | 1814 | 1416 | 1639 | | | | |
| $K_2$ | 882 | 1284 | 2185 | 1255 | 1478 | 1618 | | | | |
| $P_0$ | 1046 | 1429 | 1761 | | | | | | | |
| $P_1$ | 805 | 1585 | 2092 | | | | | | | |
| $P_2$ | 978 | 1582 | 2204 | | | | | | | |

C.D. for N marginal means =206·6 Kg/ha.
C.D. for the body of P×K table=357·8 Kg/ha.

61(M.A.E.)

(i) 843 Kg/ha. (ii) 254·6 Kg/ha. (iii) Main effects of F, N, P and interaction N×P are highly significant and interaction F×N is significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 164 | 602 | 916 | 195 | 631 | 857 | 562 | 489 | 632 | 561 |
| $F_1$ | 435 | 1204 | 1737 | 762 | 1319 | 1294 | 1169 | 1075 | 1131 | 1125 |
| Mean | 300 | 903 | 1326 | 478 | 975 | 1075 | 865 | 782 | 881 | 843 |
| $K_0$ | 304 | 918 | 1373 | 487 | 1001 | 1107 | | | | |
| $K_1$ | 260 | 874 | 1213 | 379 | 849 | 1118 | | | | |
| $K_2$ | 336 | 917 | 1391 | 568 | 1075 | 1000 | | | | |
| $P_0$ | 256 | 517 | 662 | | | | | | | |
| $P_1$ | 269 | 1154 | 1502 | | | | | | | |
| $P_2$ | 375 | 1038 | 1813 | | | | | | | |

C.D. for N or P marginal means=175·2 Kg/ha.
C.D. for F marginal means =143·0 Kg/ha.
C.D. for the body of N×P table=303·4 Kg/ha.
C.D. for the body of N×F table=247·8 Kg/ha.

**62(M.A.E.)**

(i) 1711 Kg/ha. (ii) 347·0 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 831 | 1663 | 2404 | 1564 | 1711 | 1623 | 1512 | 1633 | 1753 | 1633 |
| $F_1$ | 855 | 1867 | 2646 | 1636 | 1939 | 1793 | 1831 | 1746 | 1791 | 1789 |
| Mean | 843 | 1765 | 2525 | 1600 | 1825 | 1708 | 1671 | 1690 | 1772 | 1711 |
| $K_0$ | 811 | 1878 | 2325 | 1500 | 1882 | 1632 | | | | |
| $K_1$ | 783 | 1812 | 2474 | 1533 | 1811 | 1725 | | | | |
| $K_2$ | 935 | 1605 | 2776 | 1767 | 1782 | 1768 | | | | |
| $P_0$ | 847 | 1667 | 2286 | | | | | | | |
| $P_1$ | 789 | 2024 | 2661 | | | | | | | |
| $P_2$ | 893 | 1604 | 2628 | | | | | | | |

C.D. for N marginal means=238·8 Kg/ha.

**63(M.A.E.)**

(i) 796 Kg/ha. (ii) 272·2 Kg/ha. (iii) Main effect of N is highly significant and that of P is significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 382 | 711 | 908 | 442 | 915 | 644 | 719 | 618 | 665 | 667 |
| $F_1$ | 590 | 984 | 1201 | 895 | 955 | 925 | 988 | 815 | 973 | 925 |
| Mean | 486 | 847 | 1055 | 668 | 935 | 785 | 853 | 716 | 819 | 796 |
| $K_0$ | 462 | 841 | 1256 | 754 | 880 | 926 | | | | |
| $K_1$ | 553 | 811 | 785 | 530 | 1084 | 534 | | | | |
| $K_2$ | 444 | 889 | 1123 | 721 | 841 | 894 | | | | |
| $P_0$ | 533 | 705 | 767 | | | | | | | |
| $P_1$ | 515 | 1005 | 1286 | | | | | | | |
| $P_2$ | 411 | 832 | 1112 | | | | | | | |

C.D. for N or P marginal means=187·4 Kg/ha.

64(M.A.E.)

(i) 1122 Kg/ha. (ii) 172·6 Kg/ha. (iii) Main effect of F, N and interaction N×P are highly significant. Main effect of P and interaction N×K are significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 455 | 1076 | 1354 | 883 | 960 | 1042 | 958 | 1009 | 919 | 962 |
| $F_1$ | 828 | 1263 | 1752 | 1232 | 1246 | 1366 | 1265 | 1307 | 1271 | 1281 |
| Mean | 642 | 1170 | 1553 | 1058 | 1103 | 1204 | 1112 | 1158 | 1095 | 1122 |
| $K_0$ | 746 | 1137 | 1453 | 1100 | 1008 | 1228 | | | | |
| $K_1$ | 530 | 1237 | 1707 | 1100 | 1135 | 1240 | | | | |
| $K_2$ | 649 | 1136 | 1500 | 974 | 1166 | 1145 | | | | |
| $P_0$ | 718 | 1236 | 1229 | | | | | | | |
| $P_1$ | 541 | 1165 | 1603 | | | | | | | |
| $P_2$ | 666 | 1118 | 1828 | | | | | | | |

C.D. for N or P marginal means =118·8 Kg/ha.
C.D. for F marginal means =96·9 Kg/ha.
C.D. for the body of N×P or N×K table=205·8 Kg/ha.

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**Crop :- Jowar** (*Kharif*). **Ref :- Ms. 61,62(M.A.E.).**

**Site :- M.A.E. Centre, Gangavati.** **Type :- 'M'.**

Object :—Type IX : To study the effect of Nitro-Phosphates and the method of application on the yield of *Jowar*.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Cotton. (c) 16·8 Kg/ha. of N as A/S. (ii) Medium black. (iii) 22, 23.6.61; 14 6 62. (iv) (a) 4 harrowings and ploughing. (b) Sowing by hand drill. (c) 9·0 Kg/ha. (d) 38 cm ×15 to 23 cm. (e) N.A. (v) Nil. (vi) D. 340; (4 months duration). (vii) Irrigated. (viii) 2 hoeings and weeding once. (ix) N.A. (x) 25.10.61 to 3.11.61 ; 1 to 5.11.62.

2. TREATMENTS :

All combinations of (1), (2) and (3)+4 extra treatments in each block.

(i) 3 types of Phosphates : $P_1$=Super, $P_2$=ODDA and $P_3$=PEC.

(2) 3 levels of $P_2O_5$ : $L_1$=11·7, $L_2$=23·4 and $L_3$=46·8 Kg/ha.

(3) 3 methods of application : $M_1$=At puddling by broadcasting, $M_2$=At planting below seed and $M_3$= Immediately after planting by band placement.

Extra treatments : $E_0$=0, $E_1$=13·4, $E_2$=26·8 and $E_3$=53·6 Kg/ha. of N.

3. DESIGN :

(i) $3^3+4$ Fact. confd. (ii) (a) 13 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 11·0 m.× 5·5 m. (b) 8·8 m.×4·6 m. (v) 110 cm.×45 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1961—N.A. (b) and (c) No. (v) to (vii) Nil.

5. RESULTS :

**61(M.A.E.)**

(i) 621 Kg/ha. (ii) 282·6 Kg/ha. (iii) Main effect of L and M are highly significant. 'Extra *vs.* others' is significant. (iv) Av. yield of grain in Kg/ha.

$N_0$=387, Kg/ha. $N_1$ =461, Kg/ha. $N_2$=563 Kg/ha. and $N_3$=563 Kg/ha.

| | $L_1$ | $L_2$ | $L_3$ | $M_1$ | $M_2$ | $M_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $P_1$ | 480 | 729 | 1088 | 978 | 590 | 729 | 766 |
| $P_2$ | 535 | 516 | 941 | 756 | 341 | 895 | 664 |
| $P_3$ | 628 | 544 | 627 | 968 | 194 | 638 | 600 |
| Mean | 548 | 596 | 885 | 901 | 375 | 754 | 677 |
| $M_1$ | 618 | 876 | 1208 | | | | |
| $M_2$ | 378 | 295 | 452 | | | | |
| $M_3$ | 648 | 618 | 996 | | | | |

C.D. for L or M marginal means=190·3 Kg/ha.
C.D. for extra *vs.* others =260·8 Kg/ha.

**62(M.A.E.)**

(i) 2511 Kg/ha. (ii) 584·6 Kg/ha. (iii) Main effects of P and L are highly significant. (iv) Av. yield of grain in Kg/ha.

$N_0$=1922 Kg/ha., $N_1$=2399 Kg/ha., $N_2$=2539 Kg/ha. and $N_3$=2455 Kg/ha.

| | $L_1$ | $L_2$ | $L_3$ | $M_1$ | $M_2$ | $M_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $P_1$ | 2493 | 3082 | 3028 | 3470 | 2649 | 2485 | 2868 |
| $P_2$ | 2179 | 2860 | 3307 | 2839 | 2607 | 2900 | 2782 |
| $P_3$ | 1866 | 2376 | 2142 | 2175 | 1824 | 2385 | 2128 |
| Mean | 2179 | 2773 | 2826 | 2828 | 2360 | 2590 | 2593 |
| $M_1$ | 2343 | 3026 | 3115 | | | | |
| $M_2$ | 2109 | 2486 | 2486 | | | | |
| $M_3$ | 2086 | 2806 | 2876 | | | | |

C.D. for P or L marginal means=293.5 Kg/ha.

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**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 63 to 65 (S.F.T.)**

**Site :- (District) : Belgaum and Bellary.** **Type :- 'M'.**

Object :—Type $A_1$ : To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Deep black for Belgaum and Red sandy for other. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

## 2. TREATMENTS :

8 manurial treatments :

O =Control (no manure)
$N_1$ =35 Kg/ha. of N.
$N_2$ =70 Kg/ha. of N.
$P_1$ =35 Kg/ha. of $P_2O_5$.
$N_1P_1$ =35 Kg/ha. of N+35 Kg/ha. of $P_2O_5$.
$N_2P_1$ =70 Kg/ha. of N+35 Kg/ha. of $P_2O_5$.
$N_2P_2$ =70 Kg/ha. of N+70 Kg/ha. of $P_2O_5$.
$N_2P_2K_1$ =70 Kg/ha. of N+70 Kg/ha. of $P_2O_5$+35 Kg/ha. of $K_2O$.

N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

## 3. DESIGN :

(i) and (ii) A selected district is dividedinto four agriculturally homogeneous zones based on climate, soil, cropping pattern, etc. In each zone one block is selected at random. A block normally consists of a group of 50-100 villages. In each block 36 experiments are conducted in a year of which 11 are of type $A_1$, 11 of type $A_2$, 11 of type $A_3$ and 3 are of type C. The eleven experiments under type $A_1$, $A_2$ and $A_3$ are distributed as 3 on a *Kharif* cereal, 3 on a *rabi* cereal, 3 on a cash crop and 2 on oilseed. All the three type C experiments are conducted on a legume crop. For the purpose of conducting the $A_1$, $A_2$ and $A_3$ experiments 11 villages are randomly selected in each block and in each village 3 experiments one each of type $A_1$. $A_2$ and $A_3$ are laid out. For conducting the three type C trials three villages are randomly selected in each block. (iii) (a) 1/100 ha. (b) 1/200 ha. (iv) Yes.

## 4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1963 to 1966 for Belgaum ; 1963 to 1965 for Bellary. (b) N.A. (c) Nil. (v) to (vii) N.A.

## 5. RESULTS :

**Belgaum**

**63(S.F.T.)**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 489 | 612 | 323 | 689 | 864 | 983 | 793 | 115·6 |

Control yield=1503 Kg/ha. ; No. of trials=10.

**64(S.F.T.)**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 124 | 216 | 149 | 218 | 411 | 573 | 633 | 61·6 |

Control yield=1173 Kg/ha. ; No. of trials=7.

**65(S.F.T.)**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 207 | 230 | 192 | 346 | 149 | 529 | 597 | 53·2 |

Control yield=7[illegible]1 Kg/ha. ; No. of trials=12.

**Bellary**

**63(S.F.T.)**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 174 | 362 | 210 | 357 | 343 | 840 | 926 | 33·8 |

Control yield=983 Kg/ha. ; No. of trials=10.

**64(S.F.T.)**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 221 | 320 | 147 | 457 | 508 | 501 | 610 | 67·7 |

Control yield=937 Kg/ha. ; No. of trials=6.

**65(S.F.T.)**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 92 | 165 | 69 | 429 | 477 | 678 | 676 | 199·4 |

Control yield=1051 Kg/ha. ; No. of trials=6.

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**Crop :- Jowar** (*Rabi*). **Ref :- Ms. 62,63, 64(S.F.T.) for Belgaum and 63, 64(S.F.T.) for Bellary.**

**Site :- (District) : Belgaum and Bellary.** **Type :- 'M'.**

Object :—Type $A_1$ : To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with other nutrients.

1- BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Deep black ; for Belgaum Red sandy for Bellary. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in type $A_1$ (Kharif) on page 204.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962 to 1966 [1965 N.A. for Belgaum, 1962 and 1965 N.A. for Bellary]. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

**Belgaum**

**62(S.F.T.)**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 104 | 16 | 146 | 181 | 145 | 127 | —41 | 169·5 |

Control yield=623 Kg/ha. ; No. of trials=3.

**63(S.F.T.)**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 212 | 372 | 157 | 295 | 426 | 506 | 562 | 17·9 |

Control yield=661 Kg/ha. ; No. of trials=3.

**64(S.F.T.)**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 378 | 583 | 128 | 609 | 655 | 906 | 991 | 65.7 |

Control yield=649 Kg/ha. ; No. of trials=3.

**Bellary**

**63(S.F.T.)**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 98 | 91 | 98 | 168 | 184 | 248 | 340 | 41·6 |

Control yield=201 Kg/ha. ; No. of trials=2.

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 48 | 48 | 48 | 78 | 92 | 114 | 152 | 18·5 |

Control yield=250 Kg/ha. ; No. of trials=3.

**Crop :- Jowar (*Rabi*).** **Ref :- Ms. 64 (S.F.T.).**

**Site :- (District) : Bellary and Belgaum.** **Type :- 'M'.**

Object :—Type $A_2$ : To study the response curves of important cereal, cash and oilseed crops to Phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red sandy for Bellary and Deep black for other. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:

8 manurial treatments :

O=Control (no manure).
$N_1$=35 Kg/ha. of N.
$P_1$=35 Kg/ha. of $P_2O_5$.
$P_2$=70 Kg/ha. of $P_2O_5$.
$N_1P_1$=35 Kg/ha. of N+35 Kg/ha. of $P_2O_5$.
$N_1P_2$=35 Kg/ha. of N+70 Kg/ha. of $P_2O_5$.
$N_2P_2$=70 Kg/ha. of N+70 Kg/ha. of $P_2O_5$.
$N_2P_2K_2$=70 Kg/ha. of N+70 Kg/ha. of $P_2O_5$+70 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in type $A_1$ (*Kharif*) on page 204.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1964—only for Bellary and 1964 to 1966 [1965 N.A.] for Belgaum. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

Bellary
64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 73 | 40 | 96 | 98 | 117 | 175 | 216 | 22·2 |

Control yield=254 Kg/ha. ; No. of trials=3.

Belgaum

64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 457 | 217 | 270 | 586 | 754 | 787 | 1242 | 109·0 |

Control yield=583 Kg/ha. ; No. of trials=3.

**Crop :- Jowar (*Rabi*).** **Ref :- Ms. 63, 65 (S.F.T.) for Bellary, 62, 63(S.F.T.) for Belgaum.**

**Site :- (District) : Bellary and Belgaum.** **Type :- 'M'.**

Object :—Type $A_2$ : To study the response curves of important cereal, cash and oilseed crops to Phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Deep black for Belgaum and Red sandy for other. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in type $A_1$ (Rabi, irrigated) on page 207.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962 to 1965 [1962 and 1964 N.A.] for Bellary ; 1962 to 1963 for Belgaum. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**Belgaum**

62(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 82 | 138 | 132 | 208 | 209 | 186 | 205 | 6·2 |

Control yield=534 Kg/ha. ; No. of trials=3.

63(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 196 | 106 | 149 | 260 | 302 | 381 | 507 | 24·8 |

Control yield=625 Kg/ha. ; No. of trials=3.

**Bellary**

63(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 40 | 10 | 69 | 52 | 75 | 91 | 132 | 20·5 |

Control yield=97 Kg/ha. ; No. of trials=2.

65(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 215 | 150 | 175 | 195 | 155 | 200 | 235 | 83·7 |

Control yield=275 Kg/ha. ; No. of trials=2.

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**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 63, 64, 65(S.F.T.)**

**Site :- (District) : Belgaum and Bellary.** **Type :- 'M'.**

Object :—Type $A_2$ : To study the response curves of important cereal, cash and oilseed crops to phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) Deep black for Belgaum and Red sandy for other. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS : and 3. DESIGN :

Same as in Type $A_2$ (Rabi Irrigated) on page 207.

4. GENERAL:

(i) to (iii) N.A. (iv) (a) 1963 to 1967 for Balgaum ; 1963 to 1965 for Bellary. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**Belgaum**

63(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 321 | 190 | 263 | 478 | 542 | 754 | 865 | 36·1 |

Control yield=1487 Kg/ha. ; No. of trials=10.

64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 125 | 138 | 191 | 242 | 375 | 490 | 610 | 69·8 |

Control yield=1188 Kg/ha. ; No. of trials=7.

65(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 144 | 162 | 208 | 244 | 362 | 513 | 616 | 46·8 |

Control yield=735 Kg/ha. ; No. of trials=11.

**Bellary**

63(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 191 | 270 | 354 | 273 | 325 | 827 | 994 | 34·2 |

Control yield=993 Kg/ha. ; No. of trials=9.

64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 297 | 282 | 369 | 586 | 552 | 688 | 762 | 60·7 |

Control yield= 963 Kg/ha. ; No. of trials=6.

65(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 167 | 148 | 192 | 420 | 473 | 631 | 658 | 118·1 |

Control yield=1011 Kg/ha.; No. of trials=7.

**Crop :- Jowar** (*Kharif*). **Ref :- Ms. 63, 64,65(S.F.T.) for Belgaum and Bellary.**

**Site :- (District) : Belgaum and Bellary. . Type :- 'M'.**

Object :—Type $A_8$ : To study the response curves of important cereal, cash and oilseed crops to Potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Deep black for Belgaum and Red sandy for other. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :

O =Control (no manure).
$N_1$ =35 Kg/ha. of N.
$K_1$ =35 Kg/ha. of $K_2O$.
$K_2$ =70 Kg/ha. of $K_2O$.
$N_1K_1$ =35 Kg/ha. of N+35 Kg/ha. of $K_2O$.
$N_1K_2$ =35 Kg/ha. of N+70 Kg/ha. of $K_2O$.
$N_2K_2$ =70 Kg/ha. of N+70 Kg/ha. of $K_2O$.
$N_1P_1K_1$ =35 Kg/ha. of N+35 Kg/ha. of $P_2O_5$+35 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in type $A_1$ (*Kharif*) on page 204.

4. GENERAL INFORMATION :

(i) to (iii) N.A. (iv) (a) 1963 to 1966 for Belgaum ; 1963 to 1965 for Bellary. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**Belgaum**

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 271 | 146 | 181 | 316 | 316 | 523 | 513 | 66·2 |

Control yield=1272 Kg/ha. ; No. of trials=9.

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 134 | 59 | 128 | 199 | 264 | 354 | 325 | 61·7 |

Control yield=1185 Kg/ha. ; No. of trials=7.

65(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 131 | 226 | 213 | 311 | 387 | 486 | 554 | 43·9 |

Control yield=722 Kg/ha. ; No. of trials=10.

**Bellary**

53(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 171 | 23 | 60 | 167 | 219 | 419 | 784 | 34·0 |

Control yield=906 Kg/ha. ; No. of trials=9.

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 255 | 91 | 118 | 300 | 305 | 382 | 745 | 62.4 |

Control yield=722 Kg/ha ; No. of trials=6.

65(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 239 | 93 | 102 | 383 | 382 | 554 | 579 | 75·7 |

Control yield=850 Kg/ha. ; No. of trials=6.

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**Crop :- Jowar (*Rabi*).**

**Ref :- Ms. 62,63, 64(S.F.T.) for Belgaum and 63, 64, 65 (S.F.T.) for Bellary.**

**Site :- (District) : Belgaum and Bellary.**

**Type :- 'M'.**

Object :—Type $A_3$ : To study the response curves of important cereal, cash and oilseed crops to Potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Deep black for Belgaum and Red sandy for other. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS : and 3. DESIGN:

Same as in type $A_3$ (*Kharif*) on page 210.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962 to 1966 [1965 N.A.] for Belgaum ; 1962 to 1965 for Bellary. (b) N.A. (c) Nil. (v) to (vii) Nil,

5. RESULTS :

**Belgaum**

62(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 62 | 9 | 17 | 184 | 26 | 170 | 263 | 72·5 |

Control yield=617 Kg/ha. ; No. of trials=4.

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 67 | 78 | 89 | 123 | 134 | 235 | 201 | 37·1 |

Control yield=515 Kg/ha. ; No of trials=2.

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 339 | 200 | 299 | 556 | 688 | 865 | 882 | 109·5 |

Control yield=461 Kg/ha. ; No. of trials=3.

**Bellary**

**63(S.F.T.)**

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 74 | 69 | 33 | 74 | 103 | 125 | 156 | 32·0 |

Control yield=144 Kg/ha. ; No. of trials=2.

**64(S.F.T.)**

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 26 | 11 | −8 | 48 | 33 | 85 | 75 | 26·5 |

Control yield=246 Kg/ha. ; No. of trials=3.

**65(S.F.T.)**

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 80 | 20 | 30 | 60 | 90 | 140 | 150 | 114·0 |

Control yield=400 Kg/ha. ; No. of trials=2.

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**Crop :- Jowar (*Rabi*).** **Ref :- Ms. 60(280).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'MV'.**

Object :—To study the effect of N on different varieties of *Jowar* under irrigated conditions.

1. BASAL CONDITIONS :

(i) (a) Maize (*Kharif*)—*Jowar*. (b) Maize. (c) 12·4 C.L./ha. of F.Y.M.+33·6 Kg/ha. of N as Urea+11·2 Kg/ha. of $P_2O_5$ as Super+11·2 Kg/ha. of $K_2O$ as Pot. Sul. (ii) Black soil. (iii) N.A. (iv) (a) Ploughing and harrowing. (b) N.A. (c) 5 Kg/ha. (d) 46 cm×31 cm. (e) 2 to 3, thinned to one plant/hill. (v) 12·4 C.L./ha. of F.Y.M. by spreading. (vi) As per treatments. (vii) Irrigated. (viii) Gap filling, interculturing and hand weeding. (ix) 8 cm. (x) 16.3.61.

2. TREATMENTS :

**Main-plot treatments :**

5 varieties : $V_1$=Local, $V_2$=M—35—1, $V_3$=M—47—3, $V_4$=G.S. 560—1—1 and $V_5$=Yenigar—2.

**Sub-plot treatments :**

2 manurial doses : $M_0$=0, and $M_1$=44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$.

½ N and full P and K applied 3 weeks after planting and rest of N applied 6 weeks after planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 6·1 m. ×4·6 m. (b) 5·5 m×3·7 m. (v) One row on all sides. (vi) Yes.

4. GENERAL:

(i) The season was unfavourable.(ii) In early stages the crop was severely attacked by stem borer—Removing of stem borer and Folidol sprayed. (iii) Yield of grain. (iv) (a) 1958 to 1960. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 278 Kg/ha. (ii) (a) 179·9 Kg/ha. (b) 127·4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | $V_3$ | $V_4$ | $V_5$ | Mean |
|---|---|---|---|---|---|---|
| $M_0$ | 316 | 311 | 440 | 259 | 55 | 276 |
| $M_1$ | 246 | 385 | 312 | 355 | 101 | 280 |
| Mean | 281 | 348 | 376 | 307 | 78 | 278 |

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**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 65(99).**

**Site :- Agri. Res. Stn., Saundathi.** **Type :- 'MV'.**

Object :—To study the effect of N and P at higher levels on the yield of *Jowar* under dry farming conditions.

1. BASAL CONDITIONS :

(i) (a) Groundnut—*Jowar*. (b) Groundnut. (c) 22·4 Kg/ha. of Super. (ii) Medium black. (iii) N.A. (iv) (a) Ploughing and harrowings 4 times. (b) Dibbling. (c) 4·5 Kg/ha. (d) 46 cm.×15 cm. (e) 2. (v) 7·4 C.L./ha. of F.Y.M. applied one month before sowing. (vi) As per treatments. (vii) Unirrigated. (viii) 3 interculturings with hoes, 1 hand weeding. (ix) 48 cm. (x) N.A.

2. TREATMENTS :

**Main-plot treatments :**

3 varieties : $V_1$=G.M. 2—3—1, $V_2$=Kala gonda, and $V_3$=Fulger white.

**Sub-plot treatments :**

All combinations of (1) and (2).

(1) 3 levels of N : $N_1$=33·6, $N_2$=44·8 and $N_3$=56·0 Kg/ha.

(2) 3 levels of $P_2O_5$ : $P_1$=22·4, $P_2$=33·6 and $P_3$=44·8 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 12·2 m.× ×5·5 m. (b) 11·0 m.×4·6 m. (v) One row all round. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1965—N.A. (b) Yes (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1446 Kg/ha. (ii) (a) 322·9 Kg/ha. (b) 295·6 Kg/ha. (iii) Main effect of V alone is significant. (iv) Av. yield of grain in Kg/ha.

| | $N_1$ | $N_2$ | $N_3$ | $P_1$ | $P_2$ | $P_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $V_1$ | 1684 | 1458 | 1478 | 1595 | 1498 | 1528 | 1540 |
| $V_2$ | 1651 | 1644 | 1614 | 1614 | 1684 | 1910 | 1736 |
| $V_3$ | 1000 | 1160 | 1023 | 1120 | 1020 | 1043 | 1061 |
| Mean | 1445 | 1421 | 1472 | 1443 | 1401 | 1494 | 1446 |
| $P_1$ | 1389 | 1561 | 1379 | | | | |
| $P_2$ | 1342 | 1286 | 1575 | | | | |
| $P_3$ | 1604 | 1415 | 1462 | | | | |

C.D. for V marginal means=463·2 Kg/ha.

**Crop :- Jowar** (*Rabi*). **Ref :- Ms. 63(234), 64(203), 65(76).**

**Site :- Agri. Res. Stn., Bagalkot.** **Type :- 'C'.**

Object :—To study the effect of different cultural practices on *Jowar*.

1. BASAL CONDITIONS :

(i) (a) Nil (1963); Cotton—*Jowar* ('64, '65). (b) Nil (1963); Cotton ('64, '65). (c) Nil ('63); N.A. ('64, '65). (ii) Deep black soil. (iii) 8.10.63; N.A.; N.A. (iv) (a) 3 harrowings ('63) ; Ploughing and harrowing ('64, 65)+as per treatments. (b) Seed-drill. (c) 4·5 Kg/ha. (d) 46 cm.×30 cm. (e)—. (v) Nil. (vi) M. 35–1 (early). (vii) Unirrigated. (viii) 3 interculturings, 1 weeding. (ix) 69 cm.; 61 cm.; 26 cm. (x) 15.3.64; N.A.; N.A.

2. TREATMENTS :

5 cultural practices : $T_1$=Simple harrowing (control), $T_2$=Iron ploughing without mould plough, $T_3$=Wooden ploughing, $T_4$=Contour lisping and $T_5$=Pocket formation.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 84·1 m.×11·0 m. (iii) 4. (iv) (a) 21·0 m.×11·0 m. (b) 20·1 m.×10·1 m. (v) 91 cm. row on one side. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1962—67. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

63(234)

(i) 313 Kg/ha. (ii) 80·1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. yield | 279 | 312 | 324 | 327 | 325 |

64(203)

(i) 827 Kg/ha. (ii) 111·8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. yield | 776 | 746 | 817 | 848 | 946 |

65(76)

(i) 355 Kg/ha. (ii) 141·5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. yield | 444 | 393 | 287 | 291 | 358 |

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**Crop :- Jowar** (*Rabi*). **Ref :- Ms. 62(202), 63(189), 64(149).**

**Site :- Soil Cons. Res. Stn., Bellary.** **Type :- 'C'.**

Object :—To find out the optimum spacing for *Jowar*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow; Cotton *Jowar*. (c) Nil. (ii) Deep black cotton soil. (iii) 20.10.62; 1.10.63; 3.10.64. (iv) (a) Light harrowing. (b) Dibbling. (c) 4 Kg/ha. (d) As per treatments. (e) 1. (v) Nil. (vi) M. 35–1 (medium). (vii) Unirrigated. (viii) Hand weeding. (ix) 18 cm. ; 14 cm. ; 16 cm. (x) 6.3.63; 12.2.64; 8.2.65.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 spacings between rows : $R_1$=46 and $R_2$=91 cm.

(2) 3 spacings between plants : $P_1$=15, $P_2$=31 and $P_3$=46 cm.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. for 1962 ; 43·9 m.×9·1 m. for 1953 and '64 (iii) 4. (iv) (a) 13·7 m.× 7·3 m. in 1962 ; 9·1 m.×7·3 m. in 1963 and '64. (b) 13·7 m.×7·3 m. in 1962; 9·1 m.×6·4 m. in 1963 and '64. (v) Nil; N.A.; N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Bird damage to the *Jowar* earhead in 1963. (iii) Height measurements; No. of leaves ; yield of grain. (iv) (a) 1962—contd. (expt. failed in '65). (b) No. (c) Nil. (v) Nil. (vi) Heavy and unusual rains during Dec. '62. (vii) Nil.

5. RESULTS :

**62(202)**

(i) 288 Kg/ha. (ii) 106·2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $P_1$ | $P_2$ | $P_3$ | Mean |
|---|---|---|---|---|
| $_1$ | 335 | 290 | 282 | 302 |
| $R_2$ | 342 | 244 | 234 | 273 |
| Mean | 338 | 267 | 258 | 288 |

**63(189)**

(i) 512 Kg/ha. (ii) 96·3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $P_1$ | $P_2$ | $P_3$ | Mean |
|---|---|---|---|---|
| $R_1$ | 474 | 570 | 490 | 511 |
| $_2$ | 513 | 552 | 470 | 512 |
| Mea | 494 | 561 | 480 | 512 |

**64(149)**

(i) 663 Kg/ha. (ii) 83·3 Kg/ha. (iii) P effect is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $P_1$ | $P_2$ | $P_3$ | Mean |
|---|---|---|---|---|
| $R_1$ | 615 | 774 | 656 | 682 |
| $R_2$ | 657 | 720 | 556 | 644 |
| Mean | 636 | 747 | 606 | 663 |

C.D. for P marginal means=88·6 Kg/ha.

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**Crop :- Jowar** (*Rabi*). **Ref :- Ms. 63(195), 64(154).**

**Site :- Soil Cons. Res. Stn., Bellary.** **Type :- :C'.**

Object :—To find out the benefit in leaving reservoirs of water alternating with sown strips of crops.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) Cotton. (c) Nil. (ii) Deep black cotton soils. (iii) 1.10.63; 2.10.64. (iv) (a) As per treatments; Light harrowing in treatments $T_0$ and $T_2$ in '63. (b) Dibbling. (c) N.A. (d) 46 cm.×23 cm. (e) 1. (v) 5·6 Q/ha. of F.Y.M. (vi) M. 35—1 (medium). (vii) Unirrigated. (viii) Hoeing and hand weeding. (ix) N.A.; 2 cm. (x) N.A.; 10.2.65.

2. TREATMENTS :

5 cultural treatments : $T_0$=Control, $T_1$=Corrigation made 122 cm. apart and alternate ridges tied with grass, $T_2$=Scoops made 122 cm. apart with single basin lister, $T_3$=Corrigations made 122 cm. apart with a V ditcher and $T_4$=Bunds put with bund at 122 cm. apart.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) 76·2 m.×15·2 m. (iii) 4. (iv) (a) and (b) 15·2 m.×6·9 m. (v) Nil. (vi) Yes.

4. GENERAL ;

(i) Satisfactory except in treatment $T_1$ where the crop growth was very poor probably due to severe competition for moisture between grass and *Jowar*. (ii) Nil. (iii) Height, No. of leaves, leaf area, weight of 500 grains and yield of grain. (iv) (a) 1963—64. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent.

5. RESULTS :

63(195)

(i) 342 Kg/ha. (ii) 157·8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. yield | 388 | 125 | 377 | 413 | 406 |

64(154)

(i) 894 Kg/ha. (ii) 337·6 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. yield | 1027 | 233 | 1156 | 1073 | 980 |

C.D.=520·2 Kg/ha.

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**Crop :- Jowar** (*Rabi*). **Ref :- Ms. 64(201), 65(72).**

**Site :- Agri. Res. Stn., Bijapur.** **Type :- 'C'.**

Object :—To find out suitable spacings for *Rabi Jowar*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M.+16·8 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$. (ii) Medium black (with limy sub-soil). (iii) 23.9.64; 24.9.65. (iv) (a) Ploughing and harrowing. (b) to (e) As per treatments. (v) N.A. (vi) M. 35—1. (vii) Unirrigated. (viii) Thinning and interculturing. (ix) 26 cm.; 7 cm. (x) 3.3.65; 2.2.66.

2. TREATMENTS :

9 sowing treatments : $T_1$=Rows 46 cm. apart with 6·7 Kg/ha. as seed rate, $T_2$=31 cm.×31 cm. with 1 seed/hill, $T_3$=31 cm.×46 cm. with 1 seed/hill, $T_4$=31 cm.×46 cm. with 2 seeds/hill, $T_5$=46 cm.×46 cm. with 2 seeds/hill, $T_6$=46 cm.×61 cm. with 2 seeds/hill, $T_7$=46 cm.×61 cm. with 3 seeds/hill, $T_8$=46 cm.×23 cm. with 1 seed/hill and $T_9$=61 cm.×61 cm. with 4 seeds/hill.

Method of sowing for $T_1$ is drilling while for $T_2$ to $T_9$ it is dibbling.

First 7 treatments tried in 1964 and 9 treatments tried in 1965.

In case of dibbling, 4 seeds to be dibbled while planting and thinned after about a month to retain the respective number of seedlings as per treatments.

3. DESIGN :

(i) R.B.D. (ii) (a) 7 for 1964; 9 for '65. (b) N.A. (iii) 4. (iv) (a) 12·2 m.×5·5 m.; N.A. (b) 11·0 m.× 3·7 m.; 10·4 m.×3·7 m. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1964 to '66. (Modified in '65). (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

**64(201)**

(i) 1302 Kg/ha. (ii) 150·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 1281 | 1216 | 1323 | 1217 | 1307 | 1453 | 1319 |

**65(72)**

(i) 668 Kg/ha. (ii) 187·5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 460 | 582 | 577 | 416 | 808 | 644 | 761 | 771 | 991 |

C.D.=273·5 Kg/ha.

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**Crop :- Jowar (*Rabi*).** **Ref :- Ms. 60(120).**

**Site :- Agri. Res. Stn., Dhade Saugar.** **Type :- 'C'.**

Object :—To find out optimum space between rows and plants under dibbled conditions.

1. BASAL CONDITIONS :

(i) (a) Paddy—Cotton. (b) Cotton. (c) 44·8 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$. (ii) Deep black Cotton soil. (iii) 15.10.60. (iv) (a) Ploughing with iron plough and harrowing with blade harrow. (b) Dibbling by hand. (c) N.A. (d) As per treatments. (e) one. (v) 44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (vi) M 35—1 (125 to 130 days). (vii) Irrigated. (viii) One hand weeding. (ix) N.A. (x) 18.2.61.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 5 row spacings : $R_1$=23, $R_2$=30, $R_3$=38, $R_4$=46 and $R_5$=53 cm.

(2) 4 plant spacings : $S_1$=10, $S_2$=15, $S_3$=20 and $S_4$=25 cm.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 2. (iv) (a) and (b) 8·2 m.×6·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Slight attack of stem borer—uprooting and burning of dead heart, spraying of Endrex against ear head. (iii) Height, thickness of stem, No. of beams and nodes and yield of grain. (iv) (a) 1958 to 1960. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2597 Kg/ha. (ii) 327·5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $R_1$ | $R_2$ | $R_3$ | $R_4$ | $R_5$ | Mean |
|---|---|---|---|---|---|---|
| $S_1$ | 2989 | 2271 | 2385 | 2503 | 2458 | 2521 |
| $S_2$ | 2610 | 2316 | 2368 | 2735 | 2447 | 2495 |
| $S_3$ | 2639 | 2514 | 2518 | 3096 | 2582 | 2670 |
| $S_4$ | 2447 | 2678 | 3221 | 2752 | 2401 | 2700 |
| Mean | 2671 | 2445 | 2623 | 2772 | 2472 | 2597 |

**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 61(99).**

**Site :- Agri. Res. Stn., Dhade Saugar.** **Type :- 'C'.**

Object :—To find out the best spacing in between the rows and between plants for *Jowar*.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) Cotton. (c) 44·8 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$. (ii) Medium black Cotton soil. (iii) 16.6.61. (iv) (a) Ploughing. (b) N.A. (c) 9 to 11 Kg/ha. (d) As per treatments. (e) N.A. (v) 12:4 C.L./ha. of F.Y.M. (vi) D—3—40 (late). (vii) Irrigated. (viii) Gap filling, thinning, interculturing and hand weeding. (ix) 51 cm. (x) 2.11.61.

2. TREATMENTS :

Same as in expt. No. 60(120) on page 217.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 2. (iv) (a) and (b) 7·3 m.×4·3 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Light incidence of fly borer at the early stage—sprayed with Endrex, then there was attack of ear head bug. No control measures taken. (iii) Grain yield. (iv) (a) 1958—61. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 857 Kg/ha. (ii) 253·2 Kg/ha. (iii) Main effect of R alone is significant. (iv) Av. yield of grain in Kg/ha.

| | $R_1$ | $R_2$ | $R_3$ | $R_4$ | $R_5$ | Mean |
|---|---|---|---|---|---|---|
| $S_1$ | 658 | 668 | 908 | 1003 | 1080 | 863 |
| $S_2$ | 372 | 559 | 1017 | 971 | 872 | 758 |
| $S_3$ | 567 | 826 | 1062 | 831 | 944 | 846 |
| $S_4$ | 985 | 939 | 980 | 872 | 1030 | 961 |
| Mean | 646 | 748 | 992 | 919 | 982 | 857 |

C.D. of R marginal means=264·9 Kg/ha.

**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 60(269), 61(265), 62(275).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'C'.**

Object : To study the effect of intercultivation of G.M. on *Jowar* crop.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) Cotton. (c) N.A. (ii) Black soil. (iii) 10.7.1960 ; 23.7.1961 ; 19.7.1962. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) 4·5 Kg/ha. (d) As per treatments. (e) 2. (v) Nil. (vi) Nandayal. (vii) Unirrigated. (viii) Intercultivation by implements. (ix) 34 cm ; 35 cm ; 44 cm. (x) N.A. ; 23.12.1961 ; 27.12.1962.

2. TREATMENTS :

4 intercultivation of G.M. crops : $T_1$=38 cm. spacing between two Jowar lines, $T_2$=76 cm. spacing between two Jowar lines, $T_3$=76 cm spacing between two Jowar lines+a line of *Sannhemp* between the *Jowar* lines and $T_4$=38 cm. spacing between two *Jowar* lines+a line of *sunnhemp* after two lines of *Jowar*.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 6·9 m.×11·0 m. (b) 6·1 m.×9·8 m. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1960—'62. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous. Treatments×years interaction is present.

5. RESULTS :

(i) 2832 Kg/ha. (ii) 843·2 Kg/ha. [based on 6 d. f. made up of Treatments×years interaction ]. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 2672 | 2821 | 3123 | 2710 |

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**Crop :- Jowar.** **Ref :- Ms. 62(155).**

**Site :- Agri. Res. Stn., Naragund.** **Type :- 'C'.**

Object :— To find out different methods of cultural operations for conserving soil moisture and to obtain better yields.

1. BASAL CONDITIONS :

(i) (a) Cotton—Wheat—*Jowar*. (b) Wheat. (c) F.Y.M. at 33·6 Q/ha. (ii) Highly alkaline soil. (iii) 11.11.62. (iv) (a) As per treatments. (b) Drilling. (c) 4 Kg/ha. (d) 46 cm. between rows. (e) N.A. (v) 33·6 Kg/ha. of F.Y.M. (vi) M 35—1. (vii) Unirrigated. (viii) Hand weeding. (ix) 82 cm. (x) N.A.

2. TREATMENTS :

4 cultural treatments : $C_0$=Control, $C_1$=Wooden ploughing at contour lines, $C_2$=Iron ploughing without mould board and $C_3$=Contour listing.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 7·6 m.×7·6 m. (b) 6·1 m.×6·1 m. (v) 76 cm.×76 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Height of plant and yield of grain. (iv) (a) 1962—'64 (modified in 1964). (b) No. (c) Nil. (v) and (vi) Nil. (vii) Expt. failed in 1963.

5. RESULTS :

(i) 485 Kg/ha. (ii) 83·6 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $C_0$ | $C_1$ | $C_2$ | $C_3$ |
|---|---|---|---|---|
| Av. yield | 600 | 435 | 373 | 531 |

C.D. =133·7 Kg/ha.

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**Crop :- Jowar (*Rabi*).** **Ref ;- Ms. 64(97).**
**Site :- Agri. Res. Stn., Naragund.** **Type :- 'C'.**

Object :—To find the effect of cultural operations in conserving more moisture in soil and thereby increase the yield of *Jowar*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) N.A. (ii) Alkaline. (iii) 6.11.64. (iv) (a) As per treatments. (b) Drilling. (c) 4·5 Kg/ha. (d) 46 cm. between rows. (e) N.A. (v) Nil. (vi) M–35–1 (medium). (vii) Unirrigated. (viii) One interculturing and hand weeding. (ix) 108 cm. in whole year. (x) 26.3.65.

2. TREATMENTS :

5 cultural treatments : $C_1$=Harrowing, $C_2$=Wooden ploughing at contour lines, $C_3$=Iron ploughing without mould board, $C_4$=Pocket formation and $C_5$=Contour listing.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 8·8 m×7·62 m. (b) 7·3 m.×6·1 m. (v) 76 cm.×76 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) About 25% crop was effected by grass hopper and was controlled by dusting Gammaxene Folidol and B.H.C. mixture. (iii) Plant height, plant count, earhead count and grain yield. (iv) (a) 1962—1964 (modified in '64). (b) —. (c) Nil. (v) Bagalkot. (vi) and (vii) Nil.

5. RESULTS :

(i) 952 Kg/ha. (ii) 264·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|
| Av. yield | 930 | 855 | 968 | 969 | 1037. |

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**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 60(266).**
**Site :- Agri. Res. Stn., Raichur.** **Type :- 'C'.**

Object :- To find out the optimum spacing for *Kharif Jowar*.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Red soil. (iii) 3.6.60. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) 6·7 Kg/ha. (d) As per treatments. (e) Nil. (v) 12·4 C.L./ha. of F.Y.M. (vi) D 3-40 (vii) Unirrigated. (viii) Weeding, interculturing and thinning. (ix) 70·7 cm. (x) 6.12.60.

2. TREATMENTS:

All combinations of (1) and (2).

(1) 4 spacings between rows : $R_1=22·9$, $R_2=30·5$, $R_3=38·1$ and $R_4=45·7$ cm.

(2) 4 spacings within rows : $S_1=10·2$, $S_2=15·2$, $S_3=20·3$ and $S_4=25·4$ cm.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 8·8 m.×4·6 m. (b) 7·9 m.×3·7. (v) 2 rows all round. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Nil. (iii) Grain yield. (iv) (a) N.A. (b) No. (c) Nil. (v) N.A. (vi) Moisture was less during grain formation stage. During flag stage, seed formation was very poor. (vii) Drought conditions prevailed for more than one month.

5. RESULTS :

(i) 552 Kg/ha. (ii) 195·2 Kg/ha. (iii) Main effects of R and S are significant. (iv) Av. yield of grain in Kg/ha.

| | $R_1$ | $R_2$ | $R_3$ | $R_4$ | Mean |
|---|---|---|---|---|---|
| $S_1$ | 217 | 484 | 457 | 623 | 445 |
| $S_2$ | 484 | 559 | 624 | 520 | 547 |
| $S_3$ | 406 | 435 | 728 | 614 | 546 |
| $S_4$ | 560 | 665 | 748 | 712 | 671 |
| Mean | 417 | 536 | 639 | 615 | 552 |

C.D. for S or R marginal means=138·0 Kg/ha.

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**Crop :- Jowar (*Rabi*).** **Ref :- Ms 60(265).**

**Site :- Agri. Res. Stn.. Raichur.** **Type :- 'C'.**

Object :—To find out the optimum spacing for *Rabi Jowar.*

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Red soil. (iii) 11.10.60. (iv) Ploughing and harrowing. (b) Dibbling. (c) 6·7 Kg/ha. (d) As per treatments. (e) N.A. (v) 12·4 C.L./ha. of F.Y.M. (vi) M. 35—1. (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 12·0 cm. (v) 14.2.61.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 spacings between rows : $R_1=30·5$, $R_2=38·1$, $R_3=45·7$ and $R_4=53·3$ cm.

(2) 4 spacings within rows : $S_1=15·2$, $S_2=20·3$, $S_3=25·0$ and $S_4=30·5$ cm.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 7·9 m.×3·7 m. (v) 2 rows all round.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) Nil. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 422 Kg/ha. (ii) 137·4 Kg/ha. (iii) Main effect of R is significant. (iv) Av. yield of grain in Kg/ha.

| | $R_1$ | $R_2$ | $R_3$ | $R_4$ | Mean |
|---|---|---|---|---|---|
| $S_1$ | 363 | 411 | 426 | 400 | 400 |
| $S_2$ | 330 | 352 | 616 | 523 | 455 |
| $S_3$ | 330 | 425 | 557 | 494 | 452 |
| $S_4$ | 384 | 364 | 364 | 411 | 381 |
| Mean | 352 | 388 | 491 | 457 | 422 |

C.D. for R marginal means=97·2 Kg/ha.

**Crop :- Jowar** (*Kharif*). **Ref :- Ms. 61(84), 62(87), 63(87), 64(57).**
**Site :- Agri. Res. Stn., Saundathi.** **Type :- 'C'.**

Object :—To study the effect of double cropping in relation to the yield of succeeding crop of *Jowar* in dry tract.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) 22·4 Kg/ha. of Super applied to all the plots of Groundnut crop. (iii) Medium black. (iii) 7.7.61; 14.7.62; 7.7.63; 10.7.64. (iv) (a) 3 harrowings. (b) Drilling. (c) 7 Kg/ha. (d) 30 cm.×10 to 15 cm. (e) Nil. (v) 12·4 C.L./ha. of F.Y.M. applied one month prior to sowing+33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ at the time of sowing. (vi) Fulgar white (late). (vii) Unirrigated. (viii) 2 interculturings with hoe and hand weeding. (ix) 56 cm.; 46 cm.; 36 cm.; 55 cm. (x) 30.12.1961; 5.1.63; 20.12.63; 15.12.64.

2. TREATMENTS .

5 crop rotations : $C_0$=Groundnut (early)—Fallow—*Kharif Jowar*, $C_1$=Groundnut (early)—Wheat—*Kharif Jowar*, $C_2$=Groundnut (early)—Gram—*Kharif Jowar*, $C_3$=Groundnut (early)—*Rabi Jowar*—*Kharif Jowar* and $C_4$=Groundnut (early)—Cotton (Jayadha)—*Kharif Jowar.*

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 32·0 m.×13·7 m. (iii) 4 (iv) (a) 13·7 m.×6·4 m. (b) 11·9 m.×4·6 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Fairly satisfactory in 1961 and 62; Satisfactory in 1963 ; fairly normal but lodging was observed in 1964. (ii) Crop attacked by army worms in the early stages and Deccan wingles grass hoppers. Dusting of 10% B.H.C. done in 1961 and 1962 ; Nil in 1963 ; Stem borer attack. No control measures. (iii) Grain yield. (iv) (a) 1960 – N.A. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous. Treatments×years interaction is absent.

5. RESULTS :

(i) 1413 Kg/ha. (ii) 255·5 Kg/ha. (based on 60 d.f. made up of pooled error and Treatments×years interaction. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $C_0$ | $C_1$ | $C_2$ | $C_3$ | $C_4$ |
|---|---|---|---|---|---|
| Av. yield | 1639 | 1445 | 1411 | 1224 | 1348 |

C.D.=180·7 Kg/ha.

| Years | $C_0$ | $C_1$ | $C_2$ | $C_3$ | $C_4$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|
| 1961 | 1835 | 1723 | 1667 | 1250 | 1321 | N.S. | 1559 | 289·9 |
| 1962 | 1198 | 1149 | 1163 | 1132 | 1167 | N.S. | 1162 | 205·2 |
| 1963 | 1845 | 1551 | 1707 | 1350 | 1504 | * | 1592 | 205·0 |
| 1964 | 1679 | 1359 | 1109 | 1162 | 1402 | N.S. | 1342 | 274·4 |
| Pooled | 1639 | 1445 | 1411 | 1224 | 1348 | ** | 1413 | 255·5 |

**Crop :- Jowar** (*Kharif*). **Ref :- Ms. 60(181), 61(46).**

**Site :- Agri. Res. Stn., Bailahongal.** **Type :- 'CV'.**

Object :—To find the optimum varietal, spacing and seedrate combination for *Jowar*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A ; Gram. (c) N.A. (ii) Medium black. (iii) 17.7.60; 4, 5.8.61. (iv) (a) 2 to 3 harrowings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) 56 Q/ha. of F.Y.M.+28 Kg/ha. of N+ 22·4 Kg/ha. of $P_2O_5$. (vi) As per treatments. (vii) Unirrigated. (viii) Interculturings and hand weedings. (ix) 38 cm ; 23 cm. (x) 23.12.60; 24.12.61.

2. TREATMENTS :

**Main-plot treatments :**

3 spacings : $S_1$=38 cm.×15 cm., $S_2$=46 cm.×15 cm. and $S_3$=61 cm.×15 cm.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 2 varieties : $V_1$=G.M. 1—5 and $V_2$=B.H. 4—1—4.

(2) 2 seed rates : $R_1$=4·5 and $R_2$=6·7 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10·2 m.× 5·6 m. for $S_1$, 10·1 m.×5·5 m. for $S_2$ and 10·4 m.×5·5 m. for $S_3$. (b) 9·1 m.×4·3 m. (v) 1 row on one side and 2 rows of 30 cm. each on the other side. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil; Slight attack of rust and downey mildew. No control measures. (iii) Yield of grain. (iv) (a) 1958 to 61 (modified in '60). (b) No. (c) As under 5. Results. (v) N.A. (vi) Nil. (vii) Both the error variances are homogeneous. Both Main-plot and Sub-plot Treatments×years interactions are absent.

5. RESULTS :

(i) 1710 Kg/ha. (ii) (a) 454·8 Kg/ha. (based on 14 d.f. made up of pooled error and Treatments×years interaction). (b) 287·7 Kg/ha. (based on 61 d.f. made up of pooled error and Sub-plot Treatments×Years interaction). (iii) Only V effect is significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $R_1$ | $R_2$ | Mean |
|---|---|---|---|---|---|---|
| $V_1$ | 1536 | 1725 | 1650 | 1613 | 1661 | 1637 |
| $V_2$ | 1722 | 1767 | 1863 | 1724 | 1844 | 1748 |
| Mean | 1629 | 1746 | 1756 | 1668 | 1753 | 1710 |
| $R_1$ | 1552 | 1672 | 1781 | | | |
| $R_2$ | 1706 | 1820 | 1732 | | | |

C.D. for V marginal means=117·5 Kg/ha.

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**Crop :- Jowar** (*Kharif*). **Ref :- Ms. 60(111), 61(85), 62(86), 63(86), 64(60).**

**Site :- Agri. Res. Stn., Saundathi.** **Type :- 'CV'.**

Object :—To find out a suitable variety with proper spacings and seed rate for *Jowar*.

1. BASAL CONDITIONS:

(i) (a) *Jowar*—Groundnut. (b) Groundnut. (c) Nil. (ii) Medium black soil. (iii) 13.7.60; 7.7.61. ; N.A. ; N.A. ; N.A. (iv) (a) 3 harrowings. (b) Drilling. (c) and (d) As per treatments. (e) Nil. (v) 6·2 C.L./ha. of F.Y.M.+Fertilizer mixture at 33·6 Kg/ha. of N as A/S and 22·4 Kg/ha. of $P_2O_5$ as Super in 1960. N.A. for others. (vi) As per treatments. (vii) Unirrigated. (viii) 2 intercultures with hoe and 2 hand weedings. (ix) 44 cm.; 36 cm.; N.A. ; N.A. ; N.A. (x) 12.12.60 ; 30.12.61. ; N.A. ; N.A. ; N.A.

2 TREATMENTS :

**Main-plot treatments:**

2 varieties : $V_1$=Local and $V_2$=Fulgar white.

**Sub-plot treatments :**

3 row spacings : $S_1$=30, $S_2$=38 and $S_3$=46 cm.

**Sub-Sub-plot treatments :**

3 seed rates : $R_1$=2, $R_2$=4 and $R_3$=7 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) 44·8m.×33·4 m. (iii) 3. (iv) (a) 11·0 m.×7·3m. for $S_1$ and $S_3$ and 11·4m.×7·3m. for $S_2$. (b) 9·1m.×5·5m. (v) 91 cm.×91 cm. for $S_1$ and $S_3$ and 114 cm.×91 cm. for $S_2$. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Attack of grass-hopper. B.H.C. 10% was dusted at 22·4 Kg/ha. (iii) Grain yield. (iv) (a) 1960—N.A. (b) No. (c) As under 5. Results. (v) N.A. (vi) Nil. (vii) Sub-sub-plot error variances are heterogeneous.

5. RESULTS:

**60(111)**

(i) 1308 Kg/ha. (ii) (a) 314·7 Kg/ha. (b) 293·4 Kg/ha. (c) 167·5 Kg/ha. (iii) Main effect of R alone is significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $R_1$ | $R_2$ | $R_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $V_1$ | 1216 | 1271 | 1358 | 1297 | 1332 | 1216 | 1282 |
| $V_2$ | 1387 | 1382 | 1237 | 1355 | 1428 | 1423 | 1335 |
| Mean | 1301 | 1326 | 1297 | 1326 | 1380 | 1212 | 1308 |
| $R_1$ | 1367 | 1340 | 1371 | | | | |
| $R_2$ | 1334 | 1433 | 1373 | | | | |
| $P_3$ | 1203 | 1206 | 1249 | | | | |

C.D. for R marginal means=115·2 Kg/ha.

**61(85)**

(i) 1264 Kg/ha. (ii) (a) 334·5 Kg/ha. (b) 263·1 Kg/ha. (c) 115·6 Kg/ha. (iii) Main effect of R and interaction V×R are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $R_1$ | $R_2$ | $R_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $V_1$ | 1154 | 1106 | 1048 | 1332 | 1054 | 924 | 1103 |
| $V_2$ | 1496 | 1483 | 1298 | 1499 | 1435 | 1344 | 1426 |
| Mean | 1325 | 1294 | 1173 | 1415 | 1244 | 1134 | 1264 |
| $R_1$ | 1493 | 1410 | 1342 | | | | |
| $R_2$ | 1328 | 1336 | 1068 | | | | |
| $R_3$ | 1155 | 1137 | 1110 | | | | |

C.D. for R marginal means =79·5 Kg/ha.
C.D. for R means at the same level of V=112·5 Kg/ha.
C.D. for V means at the same level of R=392·1 Kg/ha.

**62(86)**

(i) 864 Kg/ha. (ii) (a) 226 2 Kg/ha. (b) 152·3 Kg/ha. (c) 123·0 Kg/ha. (iii) Main effect of R alone is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $R_1$ | $R_2$ | $R_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $V_1$ | 905 | 880 | 865 | 1018 | 860 | 772 | 883 |
| $V_2$ | 911 | 799 | 827 | 953 | 781 | 804 | 846 |
| Mean | 908 | 839 | 846 | 985 | 820 | 788 | 864 |
| $R_1$ | 1031 | 906 | 1016 | | | | |
| $R_2$ | 870 | 802 | 788 | | | | |
| $R_3$ | 822 | 810 | 732 | | | | |

C.D. for R marginal means=84·6 Kg/ha.

**63(86)**

(i) 1178 Kg/ha. (ii) (a) 229·8 Kg/ha. (b) 159·9 Kg/ha. (c) 153·7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $R_1$ | $R_2$ | $R_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $V_1$ | 1161 | 1161 | 1147 | 1237 | 1142 | 1090 | 1156 |
| $V_2$ | 1156 | 1252 | 1193 | 1170 | 1200 | 1231 | 1200 |
| Mean | 1158 | 1207 | 1170 | 1204 | 1171 | 1160 | 1178 |
| $R_1$ | 1187 | 1216 | 1209 | | | | |
| $R_2$ | 1133 | 1216 | 1163 | | | | |
| $R_3$ | 1154 | 1188 | 1138 | | | | |

**64(60)**

(i) 1102 Kg/ha. (ii) (a) 471·0 Kg/ha. (b) 296·8 Kg/ha. (c) 228·0 Kg/ha. (iii) Main effect of R alone is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $R_1$ | $R_2$ | $R_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $V_1$ | 942 | 972 | 895 | 1132 | 938 | 739 | 936 |
| $V_2$ | 1180 | 1346 | 1278 | 1388 | 1213 | 1204 | 1268 |
| Mean | 1061 | 1159 | 1086 | 1260 | 1076 | 971 | 1102 |
| $R_1$ | 1190 | 1294 | 1295 | | | | |
| $R_2$ | 1054 | 1094 | 1080 | | | | |
| $R_3$ | 939 | 1090 | 884 | | | | |

C.D. for R marginal means=156·9 Kg/ha.

**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 60(267), 61(263).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'CM'.**

Object :—To assess the superiority of departmental method over local method of cultivation.

1. BASAL CONDITIONS :

(i) (a) Wheat—*Jowar.* (b) Wheat. (c) N.A. (ii) Medium black soil. (iii) 10.7.1960 ; 16.7.1961. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) and (d) As per treatments. (e) 2. (v) Nil. (vi) Nandyal. (vii) Unirrigated. (viii) Intercultivation by implements. (ix) 34 cm ; 42 cm. (x) 21.12.1960 ; 12.12.1961.

2. TREATMENTS :

3 methods of cultivation :- $T_1$=No fertilizer with 38 cm. spacing and 4·5 Kg/ha of seed rate, $T_2$=Departmental methods—44·8 Kg/ha of N as A/s (½ at planting and ½ after 3 weeks)+22·4 Kg/ha of $P_2O_5$ as Super at sowing with 4·5 Kg/ha of seed rate and 61 cm. spacing and $T_3$=22·4 Kg/ha of N as A/S (half at sowing+half 3 weeks after sowing)+22·4 Kg/ha of $P_2O_5$ as Super at sowing with 61 cm. spacing and 4·5 Kg/ha. of seed rate.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 12. (iv) (a) 10·7 m.×6·1 m. (b) 7·6 m.×3·1 m. (v) and (vi) Yes.

4. GENERAL :

(i) Healthy crop. (ii) N.A. (iii) Grain yield. (iv) (a) 1960—'62 (treatments modified in 1962). (b) No. (c) As under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous. Treatment×years interaction is present.

5. RESULTS :

(i) 2641 Kg/ha. (ii) 532·7 Kg/ha. (based on 2 d.f. made up of Treatments×years interaction) (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ |
|---|---|---|---|
| Av. yield | 2140 | 3052 | 2732 |

C.D.=310·2 Kg/ha.

| Years | $T_0$ | $T_1$ | $T_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|
| 1960 | 1904 | 3026 | 2552 | ** | 2494 | 287·8 |
| 1961 | 2376 | 3078 | 2912 | ** | 2789 | 250·0 |
| Pooled | 2140 | 3052 | 2732 | ** | 2641 | 532·7 |

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**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 62(274)**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'CM'.**

Object :—To assess the superiority of departmental method over local method.

1. BASAL CONDITIONS :

(i) (a) Wheat—*Jowar.* (b) Wheat. (c) N.A. (ii) Medium black soil. (iii) 19.7.62. (iv) (a) Ploughing and harrowing. (b) Drilled. (c) and (d) As per treatments. (e) 2. (v) Nil. (vi) Nandayal. (vii) Unirrigated. (viii) Intercultivation by implements. (ix) 44 cm. (x) N.A.

2. TREATMENTS :

2 methods of cultivation :- $T_0$=No fertilizer with 38 cm. of spacing and 4·5 Kg/ha. of seed rate and $T_1$=Departmental method : 44·8 Kg/ha. N as A/S (½ at sowing+½ after 3 weeks)+22·4 Kg/ha of $P_2O_5$ as Super at sowing. Seedrate at 4·5 Kg/ha and spacing 61cm.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) 26·8 m×18·3 m. (b) 23·8 m.×12·2 m. (v) and (vi) Yes.

4. GENERAL :

(i) Healthy crop. (ii) N.A. (iii) Grain yield. (iv) (a) 1960—'62 (Treatments modified in 1962). (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) N.A.

5. RESULTS :

(i) 2820 Kg/ha. (ii) 296·5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ |
|---|---|---|
| Av. yield | 2373 | 3268 |

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**Crop :- Jowar (*Rabi*)** **Ref :- Ms. 64(96).**

**Site :- Agri. Res. Stn., Naragund.** **Type :- 'CM'.**

Object :—To study the effect of G.M. in reclaiming alkali soils and increasing the yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) As per treatments. (ii) Alkaline. (iii) 17.11.64. (iv) (a) Harrowing by blade harrow. (b) Drilling. (c) 4·5 Kg/ha. (d) 46 cm. between lines. (e) —. (v) Nil. (vi) M. 35-1 (medium). (vii) Unirrigated. (viii) One interculturing. (ix) N.A. (x) 9.4.65.

2. TREATMENTS :

6 cultural-cum-manurial treatments : $T_0$=Control (no G.M.), $T_1$=*Sannhemp* harrowed after one month, $T_2$=*Sannhemp* ploughed after 1½ months, $T_3$=Iron ploughing only, $T_4$=12·4 C.L./ha. of F.Y.M. and $T_5$=16·8 Kg/ha. of N+16·8 Kg/ha of $P_2O_5$.

3. DESIGN :

(i) R.B.D, (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 5·9 m.×5·9 m. (b) 5·0 m.×5·0 m. (v) 46 cm.×46 cm. (vi) Yes.

4, GENERAL :

(i) Very poor. (ii) Heavy attack of grass hopper. Dusted with Gammaxene, B.H.C. and Folidol mixture. (iii) Plant height, earhead count and grain yield. (iv) (a) 1964 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 254 Kg/ha. (ii) 155 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 305 | 175 | 277 | 237 | 270 | 259 |

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**Crop :- Jowar (*Rabi*).** **Ref :- Ms. 60(149), 61(138).**

**Site :- Agri. Res. Stn., Naragund.** **Type :- 'CM'.**

Object :—To study the effect of dibbling and concentrated effect of manuring on the yield of *Jowar*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat ; *Jowar*. (c) Nil ; As per treatments. (ii) Alkaline. (iii) 11.10.60 ; 13.10.61. (iv) (a) Harrowing by country blade harrow. (b) As per treatments, (c) 9 Kg/ha. (d) 46 cm.×46 cm. (e) N.A. (v) Nil. (vi) M. 35-1. (vii) Unirrigated. (viii) 1 interculturing and weeding. (ix) 56 cm. ; 49 cm. (x) N.A. ; 8.3.62.

2. TREATMENTS :

All combinations of (1) and (2)+2 extra treatments.

(1) 2 methods of sowing : $M_1$=Drilling and $M_2$=Spot dibbling.

(2) 3 manurial treatments : $T_0$=Control, $T_1$=12·4 C.L./ha. of F.Y.M. and $T_2$=N, P and K application equivalent of 12·4 C.L./ha. of F.Y.M.

Extra treatments : $E_1$=12·4 C.L./ha. of F.Y.M.+11·2 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$ with spot dibbling and $E_2$=12·4 C.L./ha. of F.Y.M.+22.4 Kg/ha. of N+22·4 Kg/ha of $P_2O_5$ with spot dibbling.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 11·0 m.×6·0 m. (b) 10·1 m.×5·0 m. (v) 46 cm. ×46 cm. (vi) Yes.

4. GENERAL :

(i) Stunted growth in 61(138). (ii) Nil. (iii) Plant height ; earhead count and yield of grain. (iv) (a) 1960—'64 (modified in 62 and again in 63). (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous. Treatment × years interaction is absent.

5. RESULTS :

60(149)

(i) 453 Kg/ha. (ii) 143·5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$E_1$=348 and $E_2$=329 Kg/ha.

| | $T_0$ | $T_1$ | $T_2$ | Mean |
|---|---|---|---|---|
| $M_1$ | 531 | 489 | 413 | 478 |
| $M_2$ | 514 | 511 | 489 | 505 |
| Mean | 522 | 500 | 451 | 491 |

61(138)

(i) 63 Kg/ha. (ii) 30·8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

$E_1$=47 and $E_2$=61 Kg/ha.

| | $T_0$ | $T_1$ | $T_2$ | Mean |
|---|---|---|---|---|
| $M_1$ | 72 | 68 | 64 | 68 |
| $M_2$ | 29 | 90 | 73 | 64 |
| Mean | 51 | 79 | 68 | 66 |

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**Crop :- Jowar** (*Rabi*). **Ref :- Ms. 62(125).**

**Site :- Agri. Res. Stn., Naragund.** **Type :- 'CM'.**

Object :—To find out the effect of method of sowing and manuring on yield of *Jowar*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) As per treatments. (ii) Alkaline. (iii) 8.11.62. (iv) (a) Harrowing by blade harrow. (b) As per treatments. (c) to (e) N.A. (v) Nil. (vi) Maldandi M 35-1 (medium). (vii) Unirrigated. (viii) 2 interculturings by hoe. (ix) 58 cm. (x) 25.3.63.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 methods of sowing : $S_1$=Spot dibbling and $S_2$=Drilling.

(2) 4 manurial treatments : $M_0$=Control, $M_1$=12·35 C.L./ha. of F.Y.M., $M_2$=N, P and K application equivalent of 12·4 C.L./ha. of F.Y.M. and $M_3$=12·4 C.L./ha. of F.Y.M. +11·2 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 11·1 m.×5·9 m. (b) 10·1 m.×5·0 m. (v) 53 cm.×46 cm. (vi) Yes.

4. GENERAL :

(i) 40% of the crop was lodged. (ii) Slight attack of sugony disease and stem borer. Affected plants were uprooted and burnt. (iii) Yield of grain. (iv) (a) 1960—64 (modified in 1962 and again in 1963). (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 726 Kg/ha. (ii) 198·6 Kg/ha. (iii) Main effect of M alone is significant. (iv) Av. yield of grain in Kg/ha.

| | $M_0$ | $M_1$ | $M_2$ | $M_3$ | Mean |
|---|---|---|---|---|---|
| $S_1$ | 557 | 747 | 948 | 782 | 758 |
| $S_2$ | 564 | 653 | 743 | 816 | 694 |
| Mean | 560 | 700 | 846 | 799 | 726 |

C.D. for M marginal means=206·5 Kg/ha.

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**Crop :- Jowar (*Rabi*).**

**Ref :- Ms. 63(110), 64(99).**

**Site :- Agri. Res. Stn., Naragund.**

**Type :- 'CM'.**

Object :—To find the effect of method of sowing and manuring on the yield of *Jowar*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) As per treatments. (ii) Alkaline. (iii) 8, 9.11.63 ; 8.11.64. (iv) (a) Harrowing by blade harrow. (b) Drilling. (c) 5 Kg/ha. (d) 46 cm. between rows. (e) N.A. (v) Nil. (vi) M 35-1 (medium). (vii) Unirrigated. (viii) 2 interculturings and 1 weeding. (ix) N.A. (x) 28.3.64 ; 25.3.65.

2. TREATMENTS :

10 treatments : $T_1$=Drilling 46 cm. apart, $T_2$=Dibbling, $T_3$=12·4 C.L./ha. of F.Y.M. and spot dibbling, $T_4$=12·4 C.L./ha. of F.Y.M. and drilling, $T_5$=N, P and K equivalent of 12·4 C.L./ha. of F.Y.M. and spot dibbling, $T_6$=N, P and K equivalent of 12·4 C.L./ha. of F.Y.M. and drilling, $T_7$=12·4 C.L./ha. of F.Y.M.+11·2 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$ and spot dibbling, $T_8$=12·4 C.L./ha. of F.Y.M.+22·4 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ and spot dibbling, $T_9$=$T_7$+56 Kg/ha. of Sulphur and $T_{10}$=$T_7$+125·6 Q/ha. of sand.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 11·9 m.×5·9 m. (b) 10·1 m.×5·0 m. (v) 54 cm.×46 cm. (vi) Yes.

4. GENERAL :

(i) 85% of the crop lodged during 12th and 13th Feb. due to heavy winds in 63(110). Good for 64(99). (ii) Nil; In the earlier stages grass hoppers damaged the crop to the extent of 20 to 25%. These were controlled by dusting B.H.C. and Gammaxene mixture. (iii) Yield of grain. (iv) (a) 1960–64 (modified in 1962 and again in '63. (b) Yes. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous. Treatment × years interaction is absent.

5. RESULTS :

(i) 931 Kg/ha. (ii) 269·7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 830 | 884 | 878 | 683 | 884 | 1072 | 1020 | 1039 | 910 | 1114 |

| Years | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1963 | 508 | 509 | 444 | 537 | 494 | 856 | 742 | 577 | 610 | 688 | N.S. | 596 | 300·0 |
| 1964 | 1152 | 1258 | 1313 | 829 | 1273 | 1289 | 1297 | 1501 | 1210 | 1540 | * | 1266 | 228·2 |
| Pooled | 830 | 884 | 878 | 683 | 884 | 1072 | 1020 | 1039 | 910 | 1114 | N.S. | 931 | 269·7 |

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**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 64(213).**

**Site :- Agri. Res. Stn., Bailahongal.** **Type :- 'CMV'.**

Object : –To study the response of local improved *Jowar* varieties to high fertility conditions and high plant population.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Groundnut. (b) Wheat. (c) 12·4 C.L./ha. of F.Y.M. (ii) Medium black. (iii) 26.7.64. (iv) (a) 4 harrowings. (b) Dibbling. (c) and (d) As per treatments. (e) 1. (v) 12·4 C.L./ha. of F.Y.M. (vi) As per treatments. (vii) Unirrigated. (viii) 2 hoeings, 1 hand weeding. (ix) 83 cm. (v) 27.12.64.

2. TREATMENTS :

**Main-plot treatments :**

2 varieties : $V_1$=*Kalagonda* and $V_2$=G M. 2—3—1.

**Sub-plot treatments :**

6 spacings : $S_1$=46 cm. × 30 cm.; $S_2$=46 cm. × 15 cm.; $S_3$=38 cm. × 30 cm., $S_4$=38 cm. × 15 cm., $S_5$= 30 cm. × 30 cm. and $S_6$=30 cm. × 15 cm.

**Sub-Sub-plot treatments :**

4 levels of N : $N_0$=0, $N_1$=25, $N_2$=50 and $N_3$=75 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block; 6 sub-plots/main-plot; 4 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 6·1 m. × 4·6 m. (v) and (vi) Yes.

4. GENERAL :

(i) Good. (ii) Army worm attack. Controlled by spraying. (iii) Yield of grain. (iv) (a) 1964—67 (Expt. for 65 N.A.) (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1226 Kg/ha. (ii) (a) 1307·0 Kg/ha. (b) 516·2 Kg/ha. (c) 224·4 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | $N_0$ | $N_1$ | $N_2$ | $N_3$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $V_1$ | 1230 | 1275 | 1132 | 1153 | 1104 | 988 | 535 | 1102 | 1309 | 1640 | 1147 |
| $V_2$ | 1263 | 1191 | 1649 | 1372 | 1401 | 953 | 551 | 1149 | 1538 | 1980 | 1305 |
| Mean | 1246 | 1233 | 1391 | 1262 | 1252 | 970 | 543 | 1126 | 1424 | 1810 | 1226 |
| $N_0$ | 631 | 507 | 704 | 476 | 593 | 347 | | | | | |
| $N_1$ | 1097 | 1262 | 1321 | 1063 | 1031 | 980 | | | | | |
| $N_2$ | 1540 | 1350 | 1513 | 1628 | 1437 | 1074 | | | | | |
| $N_3$ | 1717 | 1813 | 2024 | 1882 | 1948 | 1480 | | | | | |

C.D. for N marginal means=130·9 Kg/ha.

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**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 60(275).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'IM'.**

Object :—To find out optimum water and manurial requirements for *Jowar*.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Sandy loam, Brown masari, alluvial type. (iii) 8.6.60. (iv) (a) 2 ploughings, clod crushing and harrowing. (b) Dibbling. (c) 4·5 Kg/ha. (d) 46 cm.×30 cm. (e) 3 thinned to one. (v) 12·4 C.L./ha. of F.Y.M. spread and mixing by harrowing. (vi) Nandayal (155 days). (vii) Irrigated. (viii) Interculturing, weeding and thinning. (ix) 58 cm. (x) 24.11.60.

2, TREATMENTS :

All combinations of (1) and (2).

(1) 2 irrigations : $I_1$=6·4 ha. cm. and $I_2$=8·9 ha. cm, of irrigation.

(2) 5 manures : $M_0$=Control (no manure), $M_1$=33·6 Kg/ha. of N as A/S and G.N.C. in 1 : 2 ratio, $M_2$=33·6 Kg/ha. of N as A/S+11·2 Kg/ha. of $P_2O_5$ as Super+11·2 Kg/ha. of $K_2O$ as Pot. Sul., $M_3$=Twice $M_1$ and $M_4$=Twice $M_3$.

1st dose of $\frac{1}{2}$N+full doses of $P_2O_5$ and $K_2O$, applied 3 weeks after sowing and 2nd dose of N at 8 weeks after sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 7·3 m.×6·7 m. (b) 6·4 m.×6·1 m. (v) One row all round. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—60. (b) and (c) No. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2676 Kg/ha. (ii) 264·4 Kg/ha. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|---|
| $I_1$ | 2053 | 2332 | 2944 | 2764 | 3248 | 2668 |
| $I_2$ | 2234 | 2540 | 2606 | 2844 | 3198 | 2684 |
| Mean | 2144 | 2436 | 2775 | 2804 | 3223 | 2676 |

C.D. for M marginal means=271·3 Kg/ha.

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**Crop :- Jowar (*Kharif*).** **Ref :- Ms. 61(268), 62(109), 63(232).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'ICV'.**

Object :—To study the effect of different spacings and irrigations on different varieties of *Jowar*.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) Cotton. (c) 89·6 Q/ha. of farm compost+33·6 Kg/ha. of N+16·8 Kg/ha. of $P_2O_5$+16·8 Kg/ha. of $K_2O$. (ii) Medium black soil. (iii) 17.6.1961 ; 13.6.1962 ; 14.6.1963. (iv) (a) 1 ploughing, 2 harrowings, clod crushing and planking etc. (b) Dibbled by hand. (c) 7·4 Kg/ha. (d) As per treatments. Plants 30 cm. apart. (e) 2. (v) 89·6 Q/ha. of F.Y.M.+67·2 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ +22·4 Kg/ha. of $K_2O$ in 1961, 1963. (vi) As per treatments. (vii) Irrigated. (viii) Interculturing and hand weeding. (ix) 29 cm. ; 39 cm. ; 39 cm. (x) 4, 5.12.1961 ; 24 to 27.11.1962 ; 1, 2.12.1963.

2. TREATMENTS :

**Main-plot treatments :**

3 row spacings : $S_1$=46, $S_2$=60 and $S_3$=76 cm.

**Sub-plot treatments :**

2 varieties : $V_1$=*Nandayal* and $V_2$=*Giddmaidandi.*

**Sub-sub-plot treatments ;**

2 irrigation levels : $I_1$=6·4 ha. cm. and $I_2$=8·9 ha. cm.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 2 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) 43·9 m.×22·0 m. (iii) 3. (iv) (a) 11·0 m.×7·3 m. (b) 9·1 m.×6·1 m. (v) Yes (2 rows). (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Slight stem borer attack was observed. (iii) Germination count, height of plant, and grain yield, etc. (iv) (a) 1961—contd. (Expts. for 64 and '65 N.A.) (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Experiment is continued.

5. RESULTS :

**61(268)**

(i) 4388 Kg/ha. (ii) (a) 271·4 Kg/ha. (b) 598·4 Kg/ha. (c) 334·9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $I_1$ | $I_2$ | Mean |
|---|---|---|---|---|---|---|
| $V_1$ | 4225 | 4239 | 4282 | 4203 | 4295 | 4249 |
| $V_2$ | 4738 | 4300 | 4543 | 4573 | 4482 | 4527 |
| Mean | 4482 | 4270 | 4413 | 4388 | 4388 | 4388 |
| $I_1$ | 4518 | 4247 | 4397 | | | |
| $I_2$ | 4445 | 4292 | 4429 | | | |

**62(109)**

(i) 2989 Kg/ha. (ii) (a) 287·6 Kg/ha. (b) 327·4 Kg/ha. (c) 216·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $I_1$ | $I_2$ | Mean |
|---|---|---|---|---|---|---|
| $V_1$ | 3153 | 2909 | 3193 | 3074 | 3096 | 3085 |
| $V_2$ | 2972 | 2779 | 2927 | 2834 | 2952 | 2893 |
| Mean | 3063 | 2844 | 3060 | 2954 | 3024 | 2989 |
| $I_1$ | 3042 | 2798 | 3022 | | | |
| $I_2$ | 3083 | 2890 | 3099 | | | |

**63(232)**

(i) 3960 Kg/ha. (ii) (a) 550·6 Kg/ha. (b) 477·1 Kg/ha. (c) 261·5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $I_1$ | $I_2$ | Mean |
|---|---|---|---|---|---|---|
| $V_1$ | 4052 | 3903 | 3952 | 4000 | 3938 | 3969 |
| $V_2$ | 4237 | 4039 | 3578 | 4024 | 3878 | 3951 |
| Mean | 4144 | 3971 | 3765 | 4012 | 3908 | 3960 |
| $I_1$ | 4264 | 4106 | 3666 | | | |
| $I_2$ | 4024 | 3836 | 3864 | | | |

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**Crop :- Jowar** (*Kharif*). **Ref :- Ms. 61(270).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'ICV'.**

Object :— To study the effect of spacings and irrigations on different varieties of *Jowar*.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*—Bengal gram. (b) Cotton. (c) 12·4 C.L./ha. of F.Y.M, (ii) Black medium kirl soil (Alkaline). (iii) 17.6.61. (iv) (a) 2 ploughings, clad crushing and harrowing. (b) Dibbling. (c) 4·5 Kg/ha. (d) 46 cm. × 30 cm. (e) 3 seeds/hole (thinned to two). (v) 12·4 C.L./ha. of F.Y.M.+67·2 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$ in 3 doses. (vi) As per treatments. (vii) Irrigated. (viii) 3 weedings and 3 interculturing. (ix) 31 cm. (x) 4 and 5.12.61.

2. TREATMENS :

All combinations of (1), (2) and (3)

(1) 2 varieties : $V_1$=*Naudyal* and $V_2$=*Gtddamaladandi.*
(2) 3 spacings : $S_1$=46 cm. × 30 cm., $S_2$=61 cm. × 30 cm. and $S_3$=76 cm. × 30 cm.
(3) 2 irrigations : $I_1$=6·4 ha. cm. and $I_2$=8·9 ha. cm.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. N.A. (iii) 3. (iv) (a) 11·0 m. × 7·3 m. (b) 9·1 m. × 6·1 m. (v) and (vi) Yes.

4. GENERAL :

(i) Good (minor lodging here and there.) (ii) Slight attack of borer and rust. Affected shoots removed. and Folidol sprayed. (iii) Grain yield/plot. (iv) (a) 1961. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS :

(i) 4388 Kg/ha. (ii) 415·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | $I_1$ | $I_2$ | Mean |
|---|---|---|---|---|---|
| $S_1$ | 4225 | 4738 | 4518 | 4445 | 4481 |
| $S_2$ | 4239 | 4300 | 4247 | 4292 | 4270 |
| $S_3$ | 4282 | 4544 | 4397 | 4429 | 4413 |
| Mean | 4249 | 4527 | 4387 | 4389 | 4388 |
| $I_1$ | 4203 | 4573 | | | |
| $I_2$ | 4295 | 4482 | | | |

**Crop :- Jowar** (*Rabi*). **Ref :- Ms. 60(100).**
**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'D'.**

Object :— To find out a suitable insecticide that can control the fly borer "*Atherigora Indica*".

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton—Groundnut. (b) Groundnut. (c) 125·5 Q./ha. of F.Y.M.+44·8 Kg/ha. of $P_2O_5$ as Super. (ii) Black cotton soil. (iii) 11.10.60. (iv) (a) 2 ploughings. (b) Drilling. (c) 22 Kg/ha. (d) 28 cm.×15 cm. (e) N.A. (v) 125·5 Q./ha. of F.Y.M.+44·8 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super. (vi) M 31-2 (late). (vii) Irrigated. (viii) Hand weeding. (ix) 3 cm. (x) 17.2.61.

2. TREATMENTS :

6 insecticides : $I_0$=Control, $I_1$=2·5 c.c. of Folidol, $I_2$=57 gm. of Heptachlor 25% W.P., $I_3$=28 gm. of B.H.C. 50% W.P., $I_4$=9 c.c. of Basudin and $I_5$=6 c.c. of Endrin.

The insecticides were applied at the above rates/gallon of water.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 1/247 ha. (b) 1/329 ha. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Incidence of fly borer—as per observations. Spraying of insecticides—as per treatments. (iii) Dead heart counts were taken at weekly intervals and yield of grain. (iv) (a) 1960 only. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**Dead-heart Counts**

(i) 304 counts/plot. (ii) 49·1 counts/plot. (iii) Treatment differences are not significant. (iv) Av. of dead heart counts/plot.

| Treatment | $I_0$ | $I_1$ | $I_2$ | $I_3$ | $I_4$ | $I_5$ |
|---|---|---|---|---|---|---|
| Av. count | 298 | 296 | 328 | 342 | 264 | 297 |

**Grain Yield**

(i) 368/Kg/ha. (ii) 302·9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $I_0$ | $I_1$ | $I_2$ | $I_3$ | $I_4$ | $I_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 500 | 425 | 177 | 301 | 645 | 161 |

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**Crop :- Jowar** (*Rabi*). **Ref :- Ms. 62(62)**
**Site :-Agri. Res. Stn., Sirugappa.** **Type :- 'D'.**

Object :—To find out the efficiency of systemic insecticides in controlling the *Jowar* stemfly and also to study the residual effect.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) Cotton. (c) 125·5 Q/ha. of F.Y.M. as basal dressing+44·8 Kg/ha. of N as A/S after 40 days of sowing. (ii) (a) Black cotton soil. (iii) 25.9.62. (iv) (a) Working victory plough and country plough. Working blade harrow and band former and ridger. (b) Drilling. (c) 13 Kg/ha. (d) 28 cm.×20 cm. (e) N.A. (v) 44·8 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super. (vi) M-31-2 (medium about 130 days.) (vii) Irrigated. (viii) One hand weeding. (ix) 15 cm. (x) 1.2.63.

2. TREATMENTS :

4 insecticides : $I_0$=Control (seeds soaked in water only), $I_1$=1 ml. of metasystox in 1000 ml. of water, $I_2$=4 ml. of ekatin in 760 ml. of water and $I_3$=4 ml. of hexatin in 760 ml. of water.

Seeds were soaked for 24 hours in water, then in the above insecticides for 15 minutes before sowing. Spray at the same concentration was given when the pest incidence commenced.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 1/247 ha. (b) 1/494 ha. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Incidence of *Antherigona indica* fairly heavy. (iii) Dead heart counts were taken at weekly intervals and yield of grain and straw. (iv) (a) 1962—1963 (Treatments modified). (b) No. (c) Nil. (v) (a) N.A, (b) Nil. (vi) Nil. (vii) As there was heavy bird damage straw yields were analysed.

5. RESULTS :

(i) 8486 Kg/ha. (ii) 993·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of straw in Kg/ha.

| Treatment | $I_0$ | $I_1$ | $I_2$ | $I_3$ |
|---|---|---|---|---|
| Av. yield | 8399 | 8174 | 8592 | 8780 |

**Crop :- Jowar** (*Rabi*). **Ref :- Ms. 63(45).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'D'.**

Object :— To find the efficiency of systemic insecticide in controlling *Jowar* stemfly and also to study their residual effect.

1. BASAL CONDITIONS :

(i) (a) *Jowar*, Cotton. (b) Cotton. (c) 125·5 Q/ha. of F.Y.M. as basal dressing+44·8 Kg/ha. of N as A/S after 40 days of sowing. (ii) (a) Black cotton soil. (iii) 24.9.63. (iv) (a) Working victory plough and disc plough blade harrow, band former, and ridger. (b) Dibbling by hands. (c) 17 Kg/ha. (d) 28 cm.× 15 cm. (e) 2 to 3. (v) 44·8 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super. (vi) M-31-2 (medium.) (vii) Irrigated. (viii) 2 hand weedings and working junior hoe once. (ix) 15 cm. (x) 22.1.64.

2. TREATMENTS :

5 insecticides : $I_0$=Control (seeds soaked in water only), $I_1$=1 c.c. of metasystox/1000 c.c. of water, $I_2$=4 c.c. of ekatin/760 c.c. of water, $I_3$=4 c.c. of hexatin/760 c.c. of water and $I_4$=28 gm. of diptrex/8 gallons of water.

Seeds were first soaked in water for 6 hours and then in the above insecticides for 30 minutes before sowing.

3. DESIGN :

(i) R.B,D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 1/247 ha. (b) 1/494 ha. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Moderate incidence of fly borer and stem borer. (iii) Grain yield and dead heart counts. (iv) (a) 1962 to 1963 (Treatment modified.) (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Nil. (vii) There was heavy bird damage inspite of scaring and hence no plot wise yield were recorded.

5. RESULTS :

(i) 499 counts/plot. (ii) 62·0 counts/plot. (iii) Treatment differences are not significant. (iv) Av. dead heart count/plot.

| Treatment | $I_0$ | $I_1$ | $I_2$ | $I_3$ | $I_4$ |
|---|---|---|---|---|---|
| Av. count. | 514 | 514 | 515 | 533 | 419 |

**Crop :- Jowar** (*Kharif*). **Ref :- Ms. 63(46).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'D'.**

Object :—To find out a suitable insecticide that can control *Jowar* fly.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*. (b) Cotton. (c) 125·5 Q/ha. of F.Y.M.+22·4 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ as basal dressing and 22·4 Kg/ha. of N after 40 days of sowing. (ii) (a) Black cotton soil. (iii) 17.7.63. (iv) (a) Working victory plough. Working blade harrow bund former, and ridger. (b) to (e) N.A. (v) 125·5 Q/ha. of F.Y.M.+44·8 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super. (vi) Co.—9. (vii) Irrigated. (viii) 1 hand weeding. (ix) 48 cm. (x) 28.10.63.

2. TREATMENTS :

5 insecticides : $I_0$=Control (seeds soaked in water only). $I_1$=1 c.c. of metasystox/1000 c.c. of water, $I_2$=4 c.c. of ekatine/760 c.c. of water, $I_3$=4 c.c. of hexatine/760 c.c. of water and $I_4$=28 gm. of diptrex/760 c.c. of water.

Seeds were soaked in water for 6 hours and then in the above insecticides for 15 minutes before sowing.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 1/247 ha. (b) 1/494 ha. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Moderate incidence of *jowar* fly. (iii) Dead heart counts and grain yield. (iv) (a) 1963—N.A. (b) N.A. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Nil. (vii) Field rats affected the germination of seeds by removing the sown seeds to some extent.

5. RESULTS :

(i) 261 counts/plot. (ii) 29·0 counts/plot. (iii) Treatment differences are not significant. (iv) Av. dead heart counts/plot.

| Treatment | $I_0$ | $I_1$ | $I_2$ | $I_3$ | $I_4$ |
|---|---|---|---|---|---|
| Av. count | 286 | 253 | 252 | 258 | 255 |

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**Crop :- Jowar** (*Rabi*). **Ref :- Ms. 64(26).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'D'.**

Object :—To find out suitable insecticides that can control the *Jowar* fly.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Gram. (b) Red Gram. (c) 125·5 Q/ha. of F.Y.M.+44·8 Kg/ha, of N+22·4 Kg/ha. of $P_2O_5$ applied at the time of sowing as a basal dose. (ii) Black cotton soil. (iii) 26.9.64. (iv) (a) Working with victory plough, (b) Hand dibbling. (c) 12 to 15 Kg/ha. (d) 30 cm.×15 cm. (e) 1 to 2 (thinned to one after 5 days). (v) 125·5 Q/ha. of F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (vi) M. 31—2 (medium). (vii) Irrigated. (viii) 1 hand weeding and working with junior hoe twice. (ix) 13 cm. (x) N.A.

2. TREATMENTS :

6 insecticides : $T_0$=Control (no insecticide), $T_1$=Dimecron 100 E at 0·05%, $T_2$=Dimecron 50% 0·at05%, $T_3$=Sevin 85% at 0·05%, $T_4$=Roger 40 E at 0·05% and $T_5$=Folidol E—605 at 0·05%.

Insecticides sprayed twice.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 1/247 ha. (b) 1/494 ha. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) *Jowar* fly. (iii) Dead heart counts were taken and grain yield. (iv) (a) 1964—N.A. (b) Ist year. (c) N.A. (v) to (vii) N.A.

5. RESULTS :

**Dead Heart Count**

(i) 124 Counts/plot. (ii) 17·2 Counts/plot. (iii) The treatment differences are not significant. (iv) Av. dead heart counts/plot.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. count | 124 | 126 | 119 | 134 | 125 | 113 |

**Grain yield**

(i) 1227 Kg/ha. (ii) 324·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1278 | 1361 | 1153 | 1209 | 1142 | 1223 |

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**Crop :- Jowar** (*Kharif*). **Ref :- Ms. 64(40).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'D'.**

Object :—To find out a suitable insecticide that can control *Jowar* fly.

1. BASAL CONDITIONS:

(i) (a) *Jowar*—Cotton. (b) Cotton. (c) 125·5 Q/ha. of F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ (ii) Black cotton soil. (iii) 8.7.64. (iv) (a) Ploughing and harrowing. (b) Hand dibbling. (c) 2 to 3 Kg/ha. (d) 30 cm. × 15 cm. (e) 2 to 3. (v) 125·5 Q/ha. of F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (vi) Co.—9 (early). (vii) Irrigated. (viii) Thinning; hoeing and weeding. (ix) 58 cm. (x) 22.10.64.

2. TREATMENTS :

6 insecticides : $T_0$=Control (no insecticide), $T_1$=Dimecron 100, $T_2$=Dimecron 50, $T_3$=Sevin 85. $T_4$= Roger 40E and $T_5$=Folidol.

More details N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 1/247 ha. (b) 1/494 ha. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Dead heart counts before and after spraying insecticides. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 193 counts/plot. (ii) 26 counts/plot. (iii) Treatment differences are not significant. (iv) Av. dead heart counts/plot.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. count | 212 | 191 | 177 | 188 | 204 | 187 |

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**Crop :- Jowar** (*Kharif*). **Ref :- Ms. 65(93).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'D'.**

Object :—To find out a suitable insecticides that can control the *Jowar* fly.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*. (b) Cotton. (c) 12·4 Tons/ha. F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (ii) Black cotton soil, 70% clayey. (iii) 16.7.65. (iv) (a) Ploughing and harrowing. (b) Hand dibbling. (c) 7·4 Kg/ha. (d) 46 cm. × 23 cm. (e) 2 to 3 (thinned to 1). (v) 12·4 Tons/ha. of F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ applied before sowing. (vi) Co.—9 (early). (vii) Irrigated. (viii) Weeding and thinning. (ix) 17 cm. (x) 27.10.65.

2. TREATMEMTS :

8 spraying of insecticides : $T_0$=Control (no spraying), $T_1$=0·5 gms. of thione granules per foot row length, $T_2$=Dimecron 100 EC, $T_3$=Sevin 10%, $T_4$=Rogour 40 EC, $T_5$=Heptachlor, $T_6$= B.H.C. 10% 11·2 Kg/ha. and $T_7$=B.H.C. 10% 22·4 Kg/ha.

3. DESIGN:

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 2·7 m.×6·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) *Jowar* fly. (iii) % of dead heart counts and grain yield data. (iv) 1965–N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1778 Kg/ha. (ii) 462·7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 1573 | 2283 | 1673 | 1734 | 1929 | 1232 | 2048 | 1754 |

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**Crop :- Bajra (*Kharif*).** **Ref :- Ms. 63(S.F.T.)**

**Site :- (District) : Banglore, Chikmagalur,**
**Hassan, Mandya and Mysore.** **Type :- 'M'.**

Object:—Type $A_1$ : To study the response curves of important cereals, cash and oil seed crops to nitrogen applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red loamy for Banglore and Chikmagalur and Red sandy for others. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :
O =Control (no manure)
$N_1$=35 Kg/ha. of N.
$N_2$=70 Kg/ha. of N.
$P_1$=35 Kg/ha. of $P_2O_5$.
$N_1P_1$=35 Kg/ha. of N+35 Kg/ha of $P_2O_5$.
$N_2P_1$=70 Kg/ha. of N+35 Kg/ha. of $P_2O_5$.
$N_2P_2$=70 Kg/ha. of N+70 Kg/ha. of $P_2O_5$.
$N_2P_2K_1$=70 Kg/ha. of N+70 Kg/ha. of $P_2O_5$+35 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN:

A selected district is divided into four agriculturally homogeneous zones based on climate, soil, cropping pattern etc. In each zone one block is selected at random. A block normally consists of a group of 50—100 villages. In each block 36 experiments are conducted in a year of which 11 are of type $A_1$, 11 of type $A_2$ 11 of type $A_3$ and 3 are of type C. The eleven experiments under type $A_1$, $A_2$ and $A_3$ are distributed as 3 on a *kharif* cereal, 3 on a *rabi* cereal, 3 on a cash crop and 2 on oil seed. All the three type-C experiments are conducted on a legume crop. For the purpose of conducting the $A_1$, $A_2$ and $A_3$ experiments, 11 villages are randomly selected in each block and in each village 3 experiments one each of type $A_1$,$A_2$ and $A_3$ are laid out. For conducting the three type-C trials three villages are randomly selected in each block.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1963—only. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**Bangalore**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 571 | 711 | 318 | 622 | 724 | 760 | 940 | 51·5 |

Control yield=1581 Kg/ha. ; No. of trials=10.

**Chikmagalur**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 123 | 420 | 49 | 271 | 494 | 716 | 889 | 149·4 |

Control yield=568 Kg/ha. ; No. of trials=2.

**Hassan**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 228 | 382 | 198 | 300 | 410 | 444 | 518 | 42·7 |

Control yield=910 Kg/ha. ; No. of trials=6.

**Mandya**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 45 | 177 | 112 | 197 | 162 | 144 | 290 | 125·9 |

Control yield=2962 Kg/ha.; No. of trials=7.

**Mysore**

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 187 | 289 | 242 | 316 | 392 | 352 | 689 | 59·1 |

Control yield=907 Kg/ha. ; No. of trials=9.

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**Crop :. Bajra** (*Kharif*). **Ref :- Ms. 63 (S.F.T.).**

**Site :- (District) : Banglore, Chikmagalur, Hassan, Mandya and Mysore.** **Type :- 'M'.**

Object :—Type $A_2$ : To study the response curves of important cereal, cash and oilseed crops to Phosphorus applied singly and in cambination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red loamy for Banglore and Chikmagalur ; Red sandy for others. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS ;

8 manurial treatments :

O =Control (no manure).
$N_1$=35 Kg/ha. of N.
$P_1$=35 Kg/ha. of $P_2O_5$.
$P_2$=70 Kg/ha. of $P_2O_5$.
$N_1P_1$=35 Kg/ha. of N+35 Kg/ha. of $P_2O_5$.
$N_1P_2$=35 Kg/ha. of N+70 Kg/ha. of $P_2O_5$.
$N_2P_2$=70 Kg/ha. of N+70 Kg/ha. of $P_2O_5$.
$N_2P_2K_2$=70 Kg/ha. of N+70 Kg/ha. of $P_2O_5$+70 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in type $A_1$ on page 238

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1963—only. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**Belgaum**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 505 | 388 | 527 | 461 | 670 | 670 | 871 | 40·4 |

Control yield=1518 Kg/ha. ; No. of trials=10.

**Chikmagalur**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 74 | 49 | 296 | 469 | 642 | 889 | 1260 | 108·8 |

Control yield=543 Kg/ha. ; No. of trials=2.

**Hassan**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 182 | 105 | 162 | 274 | 348 | 390 | 502 | 30·3 |

Control yield=943 Kg/ha. ; No. of trials=7.

**Mandya**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 59 | 97 | 217 | 120 | 124 | 226 | 388 | 87·4 |

Control yield=2938 Kg/ha. ; No. of trials=7.

**Mysore**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 293 | 236 | 306 | 220 | 447 | 426 | 686 | 68·2 |

Control yield=658 Kg/ha ; No. of trials=9.

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**Crop :- Bajra** (*Rabi*). **Ref :- Ms. 63(S.F.T .)**

**Site :- (District) : Banglore, Chikmagalur, Hassan, Mandya and Mysore.** **Type :- 'M'.**

Object : –Type $A_3$ : To study the response curves of important cereal, cash and oilseed crops to Potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red loamy for Banglore and Chikmagalur ; Red sandy for others. (iii) to (vi) N.A. (vii) Unirigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :

O=Control (no manure).

$N_1$=35 Kg/ha. of N.

$K_1$=35 Kg/ha. of $K_2O$.

$K_2$=70 Kg/ha. of $K_2O$.

$N_1K_1$=35 Kg/ha. of N+35 Kg/ha. of $K_2O$.

$N_1K_2$=35 Kg/ha. of N+70 Kg/ha. of $K_2O$.

$N_2K_2$=70 Kg/ha. of N+70 Kg/ha. of $K_2O$.

$N_1P_1K_1$=35 Kg/ha. of N+35 Kg/ha. of $P_2O_5$+35 Kg/ha. of $K_2O$.

N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in type $A_1$ on page 238.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1963 – only. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**Banglore**

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 619 | 379 | 442 | 501 | 577 | 656 | 856 | 31·8 |

Control yield=1651 Kg/ha. ; No. of trials=11.

**Chikmagalur**

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 0 | –148 | 98 | 197 | 370 | 518 | 568 | 118·0 |

Control yield=518 Kg/ha. ; No. of trials=2.

**Hassan**

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 269 | 116 | 168 | 325 | 381 | 427 | 527 | 51·8 |

Control yield=891 Kg/ha. ; No. of trials=7.

**Mandya**

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 78 | —58 | 17 | 138 | —32 | 200 | 74 | 99·5 |

Control yield=2935 Kg/ha. ; No. of trials=6.

**Mysore**

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 244 | 243 | 249 | 318 | 398 | 591 | 716 | 81·2 |

Control yield=821 Kg/ha. ; No. of trials=9.

**Crop :- Bajra** (*Kharif*). **Ref :- Ms. 60(145), 61(118),62(130).**

**Site :- Agri. Res. Stn., Bijapur.** **Type :- 'C'.**

Object :— To find out suitable spacing and economic seed rate for *Bajra*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut ; Tur ; *Jowar*. (c) 12·4 C.L./ha. of F.Y.M. for 60 and 61 ; 12·4 C.L./ha. of F.Y.M.+11·2 Kg/ha. of N as A/S for 62. (ii) Medium type. (iii) 4.7.60 ; 30.6.61 ; 3.7.62. (iv) (a) Ploughing and 3—4 harrowings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) 12·4 C.L./ha. of F.Y.M. (vi) Golgeri 1—8—5. (vii) Unirrigated. (viii) 2 interculturings and 1 hand weeding ; 3 interculturings ; 2 hand weedings and 2 interculturings. (ix) 82 cm. ; 27 cm. ; 70 cm. (x) 13.11.60 ; 10.12.61 ; 10.11.62.

2. TREATMENTS :

**Main-plot treatments :**
3 spacings between rows : $S_1$=23, $S_2$=30 and $S_3$=38 cm.

**Sub-plot treatments :**
3 seed rates : $R_1$=2, $R_2$=4 and $R_3$=7 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) For $S_1$ 7·3 m.×5·5 m., for $S_2$ 7·3 m ×5·8 m. and for $S_3$ 7·3 m.×6·1 m. (b) 6·1 m.×5·5 m. (v) and (vi) Yes.

4. GENERAL :

(i) Normal ; 50% lodging ; Normal. (ii) Ergot disease to some extent. No control measures. (iii) Yield of grain. (iv) (a) 1960 – 1962 (b) No. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Main and sub-plot error variances are homogeneous and both main and sub-plot Treatments×years interactions are present.

5. RESULTS ;

(i) 387 Kg/ha. (ii) (a) 127·0 Kg/ha. (based on 4 d.f. made up of Treatments×years interaction.) (b) 84·5 Kg/ha. (based on 12 d.f. made up of Treatments×years interaction). (iii) Main effect of R is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $R_1$ | $R_2$ | $R_3$ | Mean |
|---|---|---|---|---|
| $S_1$ | 505 | 396 | 332 | 411 |
| $S_2$ | 404 | 431 | 321 | 385 |
| $S_3$ | 393 | 381 | 320 | 365 |
| Mean | 434 | 403 | 324 | 387 |

C.D. for R marginal means=43·4 Kg/ha.

| Years | $S_1$ | $S_2$ | $S_3$ | Sig | $R_1$ | $R_2$ | $R_3$ | Sig. | G.M. | S.E./Main plot | S.E./Sub-plot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 244 | 231 | 244 | N.S. | 249 | 261 | 209 | * | 240 | 43·8 | 49·5 |
| 1961 | 612 | 625 | 600 | N.S. | 680 | 638 | 519 | ** | 612 | 76·6 | 56·8 |
| 1962 | 377 | 298 | 251 | N.S. | 373 | 308 | 245 | ** | 309 | 68·7 | 73·4 |
| Pooled | 411 | 385 | 365 | N.S. | 434 | 403 | 324 | ** | 387 | 127·0 | 84·5 |

**Crop :- Bajra (*Kharif*).** **Ref :- Ms. 65(77).**

**Site :- Agri. Res. Stn., Bagalkot.** **Type :- 'CMV'.**

Object : – To study the effect of spacings and levels of N on different varieties of *Bajra*.

### 1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Black soil. (iii) 1.7.65. (iv) (a) Ploughing and harrowing. (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 25·6 cm. (x) 30.10.1965.

### 2. TREATMENTS :

All combination of (1), (2) and (3).

(1) 2 varieties : $V_1$=G 1—8—5 and $V_2$=HB—1.
(2) 3 levels of N : $N_0=0$, $N_1=60$ and $N_2=120$ Kg/ha.
(3) 3 row spacings : $S_1=45$, $S_2=67·5$ and $S_3=90$ cm.

### 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 5·5 m.×5·5 m. (v) and (vi) Yes.

### 4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) 1965—1966. (b) No. (c) Nil. (v) to (vii) Nil.

### 5. RESULTS :

(i) 1363 Kg/ha. (ii) 283 Kg/ha. (iii) Main effects of V and N are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $S_1$ | $S_2$ | $S_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $V_1$ | 1025 | 1213 | 1329 | 1148 | 1151 | 1268 | 1189 |
| $V_2$ | 1405 | 1653 | 1551 | 1671 | 1436 | 1502 | 1536 |
| Mean | 1215 | 1433 | 1440 | 1409 | 1294 | 1385 | 1363 |
| $S_1$ | 1272 | 1444 | 1512 | | | | |
| $S_2$ | 1098 | 1414 | 1369 | | | | |
| $S_3$ | 1274 | 1442 | 1439 | | | | |

C.D. for V marginal means=119·1 Kg/ha.
C.D. for N marginal means=145·9 Kg/ha.

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**Crop:- Bajra (*Kharif*).** **Ref :- Ms. 65(74).**

**Site:- Agri. Res. Stn., Bijapur.** **Type :- 'CMV'.**

Object :— To study the influence of row spacings and levels of nitrogen on the yield of *Bajra* varieties.

### 1. BASAL CONDITIONS :

(i) (a) Nil, (b) and (c) N.A. (ii) Limy soil and medium black. (iii) 15.6.65. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) 4·5 Kg/ha. (d) 15 cm. within rows. (e) 2. (v) 12·4 C.L./ha. of F.Y.M.+ 56 Kg/ha. of $P_2O_5$. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 20·5 cm. (x) 6.10.65 and 28.10.65.

### 2. TREATMENTS :

Same as in Expt. No. 65(77) on page 243.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 5. (iv) (a) 6·1 m.×5·5 m. (b) 5·5 m.×3·7 m. (v) and (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1965—1967. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 848 Kg/ha. (ii) 219·8 Kg/ha. (iii) Main effects of V and N are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $S_1$ | $S_2$ | $S_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $V_1$ | 551 | 758 | 965 | 804 | 759 | 711 | 758 |
| $V_2$ | 720 | 1042 | 1052 | 1024 | 868 | 921 | 938 |
| Mean | 636 | 900 | 1008 | 914 | 813 | 816 | 848 |
| $S_1$ | 673 | 993 | 1077 | | | | |
| $S_2$ | 669 | 874 | 897 | | | | |
| $S_3$ | 565 | 833 | 1051 | | | | |

C.D. for V marginal means=92·5 Kg/ha.
C.D. for N marginal means=113·3 Kg/ha.

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**Crop :- Bajra (*Kharif*).** **Ref :- Ms. 60(146), 61(142), 62(131).**
**Site :- Agri. Res. Stn., Bijapur.** **Type :- 'D'.**

Object :– To study the effect of fungicides on *Bajra* against the control of ergot disease.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Bajri*. (c) Nil. (ii) Medium loamy soil. (iii) 5.7.60 ; 12.7.61 ; 5.7.62. (iv) (a) 2 to 3 ploughings and harrowings. (b) Sowing by drill. (c) 7 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) Bijapur—11—11—7—14 (medium). (vii) Unirrigated. (viii) 2 interculturings and 1 hand weeding. (ix) 82 cm. ; 43 cm. ; 70 cm. (x) 15.11.60 ; 20.12.61 ; 16.11.62.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 2 soil treatments : $T_1$=Treated and $T_2$=Untreated.
(2) 2 seed treatments : $S_1$=Treated and $S_2$=Untreated.

Soil is treated with fine Sulphur at 44·8 Kg/ha. Seeds treated with Agroson G.N.C. 0·2% by weight.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) 9·1 m.×9·8 m. (iii) 4. (iv) (a) 9·1 m.×2·4 m. (b) 7·3 m.×1·8 m. (v) 91 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Ergot disease. (iii) Plant counts, height of plants, No. of Ergot and yield of grain. (iv) (a) 1960—1962. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent. Hence results of individual years are presented under 5—Results.

5. RESULTS :

**60(146)**

(i) 855 Kg/ha. (ii) 184·8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $T_1$ | 935 | 907 | 921 |
| $T_2$ | 781 | 799 | 790 |
| Mean | 858 | 853 | 855 |

**61(142)**

(i) 547 Kg/ha. (ii) 61·1 Kg/ha. (iii) Main effect of S and S×T interaction are significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $T_1$ | 586 | 568 | 577 |
| $T_2$ | 630 | 404 | 517 |
| Mean | 608 | 486 | 547 |

C.D. for S marginal means=67·2 Kg/ha.

C.D. for body of S×T table=95·0 Kg/ha.

**62(131)**

(i) 183 Kg/ha. (ii) 24·8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $T_1$ | 171 | 181 | 176 |
| $T_2$ | 201 | 179 | 190 |
| Mean | 186 | 180 | 183 |

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**Crop :- Maize (*Kharif*).** **Ref :- Ms. 64 (S.F.T.).**

**Site :- (District) : Belgaum.** **Type :- 'M'.**

Object :— Type $A_1$ : To study the response curves of important cereal, cash and oilseed crops to Nitrogen applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Deep black. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :

O=Control (no manure) :
$N_1$=60 Kg/ha. of N.
$N_2$=120 Kg/ha. of N.
$P_1$=35 Kg/ha. of $P_2O_5$.
$N_1P_1$=60 Kg/ha. of N+35 Kg/ha. of $P_2O_5$.
$N_2P_1$=120 Kg/ha. of N+35 Kg/ha. of $P_2O_5$.
$N_2P_2$=120 Kg/ha. of N+70 Kg/ha. of $P_2O_5$.
$N_2P_2K_1$=120 Kg/ha. of N+70 Kg/ha. of $P_2O_5$+35 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN:

(i) and (ii) A selected district is divided into four agriculturally homogeneous zones based on climate, soil, cropping pattern, etc. In each zone one block is selected at random. A block normally consists of a group of 50 - 100 villages. In each block 36 experiments are conducted in a year of which 11 are of type $A_1$, 11 of type $A_2$, 11 of type $A_3$ and 3 are of type C. The eleven experiments under type $A_1$, $A_2$ and $A_3$ are distributed as 3 on a *kharif* cereal, 3 on a *rabi* cereal, 3 on a cash crop and 2 on oilseed. All the three type-C experiments are conducted on a legume crop. For the purpose of conducting the $A_1$, $A_2$ and $A_3$ experiments 11 villages are randomnly selected in each block and in each village 3 experiments one each of type $A_1$, $A_2$ and $A_3$ are laid out. For conducting the three type-C trials three villages are randomly selected in each block. (iii) (a) 1/100 ha. (b) 1/200 ha. (iv) Yes.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1964 only. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 417 | 565 | 159 | 540 | 679 | 738 | 782 | 59·8 |

Control yield=4371 Kg/ha. ; No. of trials=2.

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**Crop :- Maize (*Kharif*).** **Ref :- Ms. 64 (S.F.T.).**
**Site :- (District) : Belgaum.** **Type :- 'M'.**

Object :—Type $A_2$ : To study the response curves of important cereal, cash and oilseed crops to phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Deep black. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :

O =Control (no manure).
$N_1$ =35 Kg/ha. of N.
$P_1$ =35 Kg/ha. of $P_2O_5$.
$P_2$ =70 Kg/ha. of $P_2O_5$.
$N_1P_1$ =35 Kg/ha. of N+35 Kg/ha. of $P_2O_5$.
$N_1P_2$ =35 Kg/ha. of N+70 Kg/ha. of $P_2O_5$.
$N_2P_2$ =70 Kg/ha. of N+70 Kg/ha. of $P_2O_5$.
$N_2P_2K_2$ =70 Kg/ha. of N+70 Kg/ha. of $P_2O_5$+70 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in Type $A_1$ on page 245

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1964 only. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 108 | 54 | 84 | 148 | 202 | 336 | 464 | 49·6 |

.Control yield=4591 Kg/ha. ; No. of trials=2.

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**Crop :- Maize (*Kharif*).** **Ref :- Ms. 61(271).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'MV'.**

Object :—To find out the optimum requirement of the crop regarding N, P and K for the hybrid that is being recommended to the cultivators.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Maize and Cotton mixture. (c) 22·4 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (ii) Black sandy loam. (iii) 24.6.61. (iv) (a) Ploughing, harrowing and levelling. (b) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Interculturing. (ix) 12 cm. (x) N.A.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1), (2) and (3).

2 varieties : $V_1$=Local and $V_2$=Deccan hybrid *makka* (late).

**Sub-plot treatments :** All combinations of (1), (2) and (3).

(1) 5 levels of N : $N_0=0$, $N_1=44·8$, $N_2=89·6$, $N_3=134·4$ and $N_4=179·2$ Kg/ha.

(2) 3 levels of $P_2O_5$ : $P_0=0$, $P_1=44·8$ and $P_2=89·6$ Kg/ha.

(3) 2 levels of $K_2O$ : $K_0=0$, $K_1=89·6$ Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication; 30 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×3·7 m. (b) 9·1 m.×2·9 m. (v) 1 row on each side. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Aphid attack-sprayed with Endrex 50E.C. Folidol sprayed against cater pillars. 2—4,D sprayed to control weeds. (iii) Yield of grain. (iv) (a) 1961. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 4250 Kg/ha. (ii) (a) 21·4 Kg/ha. (b) 8·8 Kg/ha. (iii) Main effects of V, N and interaction V×N are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $N_4$ | $K_0$ | $K_1$ | $V_1$ | $V_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $P_0$ | 3313 | 3415 | 4168 | 5048 | 5048 | 4158 | 4239 | 5002 | 3395 | 4198 |
| $P_1$ | 3255 | 3919 | 4126 | 4793 | 5280 | 4294 | 4255 | 5036 | 3514 | 4274 |
| $P_3$ | 3050 | 3818 | 4300 | 4765 | 5466 | 4431 | 4128 | 5192 | 3367 | 4279 |
| Mean | 3206 | 3717 | 4198 | 4868 | 5264 | 4294 | 4207 | 5076 | 3425 | 4250 |
| $V_1$ | 3359 | 4271 | 5003 | 6009 | 6740 | 5069 | 5083 | | | |
| $V_2$ | 3053 | 3163 | 3393 | 3727 | 3789 | 3520 | 3331 | | | |
| $K_0$ | 3311 | 3840 | 4196 | 4913 | 5212 | | | | | |
| $K_1$ | 3101 | 3595 | 4200 | 4824 | 5316 | | | | | |

C.D. for V marginal means =8·7 Kg/ha.

C.D. for N marginal means =1·1 Kg/ha.

C.D. for V means at the same level of N=2·2 Kg/ha.

C.D. for N means at the same level of V=5·0 Kg/ha.

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**Crop :- Maize (*Kharif*).** **Ref :- Ms. 62(82), 63(82).**

**Site :- Agri. College Farm, Dharwar.** **Type :- 'MV'.**

Object :—To study the effect of fertilizers on the various varieties of hybrid Maize.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Chilly+Cotton. (c) 12·4 C.L./ha. of F.Y.M.+33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+5·6 Kg/ha. of $K_2O$. (ii) Black soil. (iii) 20.7.62; 6.8.63. (iv) (a) 3 harrowings. (b) Dibbling. (c) 22 Kg/ha. (d) 61 cm.×30 cm. (e) 2. (v) 56·0 Kg/ha. of $P_2O_5$+56·0 Kg/ha. of $K_2O$. (vi) As per treatments. (vii) Unirrigated. (viii) Interculturing and weeding. (ix) 78 cm. ; 79 cm. (x) 1.11.62 ; 22.11.63.

2. TREATMENTS :

**Main-plot treatments :**

3 varieties : $V_1$=Ranjit, $V_2$=Deccan and $V_3$=Ganga—101.

**Sub-plot treatments :**

4 levels of N as A/S : $N_1$=56·0, $N_2$=112·1, $N_3$=168·1 and $N_4$=224.2 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication, 4 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 9·1 m.×6·1 m. (b) 7·3 m.×4·9 m. (v) 91 cm.×61 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. Some lodging occurred due to rains on 6.10.62 in 62(82). (ii) Nil. (iii) Yield of grain. (iv) (a) 1962—63. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Sub-plot error variances are heterogeneous. Results of individual years are presented under 5. Results.

5. RESULTS :

**62(82)**

(i) 5800 Kg/ha. (ii) (a) 1049·0 Kg/ha. (b) 932·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $N_1$ | $N_2$ | $N_3$ | $N_4$ | Mean |
|---|---|---|---|---|---|
| $V_1$ | 5530 | 4520 | 5930 | 6690 | 5668 |
| $V_2$ | 5640 | 5770 | 5300 | 5750 | 5615 |
| $V_3$ | 5690 | 5610 | 6500 | 6670 | 6118 |
| Mean | 5620 | 5300 | 5910 | 6370 | 5800 |

**63(82)**

(i) 4102 Kg/ha. (ii) (a) 519·0 Kg/ha. (b) 327·8 Kg/ha. (iii) N effect is highly significant. V effect is significant. (iv) Av. yield of grain in Kg/ha.

| | $N_1$ | $N_2$ | $N_3$ | $N_4$ | Mean |
|---|---|---|---|---|---|
| $V_1$ | 3136 | 4170 | 4533 | 4989 | 4207 |
| $V_2$ | 3491 | 4144 | 4810 | 4786 | 4308 |
| $V_3$ | 3237 | 3590 | 4097 | 4234 | 3790 |
| Mean | 3288 | 3968 | 4480 | 4670 | 4102 |

C.D. for V marginal means=333·8 Kg/ha.

C.D. for N marginal means=220·3 Kg/ha.

**Crop :- Maize** (*Rabi*). **Ref :- Ms. 63(81).**

**Site :- Agri. College Farm, Dharwar.** **Type :- 'MV'.**

Object :—To study the effect of fertilizers on different varieties of hybrid Maize under irrigated conditions.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Chilly+Cotton. (c) 12·4 C.L./ha. of F.Y.M.+33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+5·6 Kg/ha. of $K_2O$. (ii) Black soil. (iii) 30.10.63. (iv) (a) 3 harrowings. (b) Dibbling. (c) 22 Kg/ha. (d) 61 cm.×30 cm. (e) 2 seeds/hill. (v) 56 Kg/ha. of $P_2O_5$+56 Kg/ha. of $K_2O$. (vi) As per treatments. (vii) Irrigated. (viii) Interculturing and weeding. (ix) 79 cm. (x) N.A.

2. TREATMENTS :

Same as in expt. No. 62(82), 63(82) on page 248.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication, 4 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 6·1 m.×4·9 m. (b) 4·9 m.×3·7 m. (v) 61 cm.×61 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 4148 Kg/ha. (ii) (a) 1686·9 Kg/ha. (b) 578·0 Kg/ha. (iii) N effect is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $N_1$ | $N_2$ | $N_3$ | $N_4$ | Mean |
|---|---|---|---|---|---|
| $V_1$ | 4850 | 4767 | 4673 | 4552 | 4710 |
| $V_2$ | 4605 | 5049 | 4385 | 3264 | 4326 |
| $V_3$ | 3653 | 3447 | 3532 | 3002 | 3409 |
| Mean | 4369 | 4421 | 4197 | 3606 | 4148 |

C.D. for N marginal means=978·9 Kg/ha.

**Crop :- Maize (*Rabi*).** **Ref :- Ms. 61(107).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'CV'.**

Object :—To find out the effect of spacing on different varieties of Maize.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—*Sannhemp*—Maize. (b) *Sannhemp*. (c) No. (ii) Black mixed soil. (iii) 27.10.61. (iv) (a) Ploughing and harrowing. (b) and (c) N.A. (d) As per treatments. (e) Nil. (v) 403·5 Q/ha. of G.M. (vi) As per treatments. (vii) Irrigated. (viii) Thinning, 2 interculturings and 3 weedings. (ix) 2 cm. (x) 13.3.62.

2. TREATMENTS :

**Main-plot treatments :**

5 varieties : $V_1$=Deccan 1, $V_2$=Ganga 101, $V_3$=A.D. cura, $V_4$=3 way hybrid and $V_5$=Local.

**Snb-plot treatments :**

4 spacings : $S_1$=61 cm.×23 cm., $S_2$=61 cm.×30 cm., $S_3$=61 cm.×38 cm. and $S_4$=61 cm.×46 cm.

3. DESIGN ;

(i) Split-plot. (ii) (a) 5 main-plots/replication, 4 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 3·1 m.×9·1 m. (b) 1·8 m.×9·1 m. (v) 1 row on either side length-wise. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) Yield of grain. (iv) (a) 1961—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 4284 Kg/ha. (ii) (a) 525·6 Kg/ha. (b) 418·3 Kg/ha. (iii) Main effects of V and S are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | $V_3$ | $V_4$ | $V_5$ | Mean |
|---|---|---|---|---|---|---|
| $S_1$ | 6727 | 6309 | 5023 | 3095 | 4007 | 5032 |
| $S_2$ | 6189 | 6070 | 3977 | 3379 | 3110 | 4545 |
| $S_3$ | 5955 | 5217 | 3797 | 1914 | 2721 | 3921 |
| $S_4$ | 5591 | 5217 | 3528 | 1973 | 1884 | 3639 |
| Mean | 6116 | 5703 | 4081 | 2590 | 2930 | 4284 |

C.D. for V marginal means=729·5 Kg/ha.

C.D. for S marginal means=398·3 Kg/ha.

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**Crop :- Maize (*Kharif*).** **Ref :- Ms. 60(273).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'CMV'.**

Object :—Nitrogen-*cum*-spacing-*cum*-Varietal trial on *Kharif* Maize.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—Maize. (b) Sugarcane. (c) 22·4 Kg/ha. of N. (ii) Sandy loam. (iii) 23.6.60. (iv) (a) 2 tractor ploughings, 2 wooden ploughings and 2 harrowings. (b) Hand dibbling. (c) N.A. (d) 91cm.×30cm. (e) 1 seed/hill. (v) N, P and K at 22·4 Kg/ha. each, applied before sowing. (vi) As per treatments. (vii) Irrigated. (viii) Bullock interculturing and hand weeding. (ix) 50·8 cm. (x) 28.10.60.

2. TREATMENTS :

**Main-plot treatments :**

2 varieties : $V_1$=Teras 26 and $V_2$=Local.

**Sub-plot treatments :**

All combinations of (1), (2) and (3)

(1) 2 Spacings between rows : $R_1$=61 and $R_2$=91 cm.

(2) 3 Spacings between plants : $P_1$=18·3, $P_2$=36·7 and $P_3$=54·9 cm.

(3) 4 levels of N : $N_0$=0, $N_1$=44·8, $N_2$=89·6 and $N_3$=179·2 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication, 24 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 9·1 m. × 1·8 m. (v) 1 row on either side. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Leaf eating caterpiller--controlled by Nicotine Sulphate and Folidol. (iii) Yield of grain. (iv) (a) 1960 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 8863 Kg/ha. (ii) (a) 4167 Kg/ha. (b) 2294 Kg/ha. (iii) Main effects of V, N, P, R and interaction V×P are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $R_1$ | $R_2$ | $P_1$ | $P_2$ | $P_3$ | $N_0$ | $N_1$ | $N_2$ | $N_3$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $V_1$ | 7927 | 6588 | 9663 | 6636 | 5472 | 6255 | 6997 | 8123 | 7653 | 7257 |
| $V_2$ | 11201 | 9736 | 9706 | 11100 | 10601 | 8223 | 10400 | 11718 | 11534 | 10469 |
| Mean | 9564 | 8162 | 9684 | 8868 | 8037 | 7239 | 8699 | 9921 | 9593 | 8863 |
| $N_0$ | 7735 | 6743 | 7350 | 7544 | 6823 | | | | | |
| $N_1$ | 9180 | 8218 | 9162 | 8602 | 8333 | | | | | |
| $N_2$ | 11021 | 8821 | 10799 | 10365 | 8598 | | | | | |
| $N_3$ | 10321 | 8866 | 11427 | 8960 | 8392 | | | | | |
| $P_1$ | 10038 | 9330 | | | | | | | | |
| $P_2$ | 9556 | 8179 | | | | | | | | |
| $P_3$ | 9097 | 6976 | | | | | | | | |

C.D. for V marginal means =1914 Kg/ha.
C.D. for R marginal means =652·2 Kg/ha.
C.D. far P marginal means =798·8 Kg/ha.
C.D. for N marginal means =922·4 Kg/ha.
C.D. for V means at the same level of P=207·7 Kg/ha.
C.D. for P means at the same level of V=573·5 Kg/ha.

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**Crop :- Maize** (*Kharif*). **Ref :- Ms. 61(272).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'CMV'.**

Object :—To observe the yield response in relation to N and plant population.

1. BASAL CONDITIONS:

(i) (a) Maize—*Sannhemp*. (b) *Sannhemp*. (c) 22·4 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+11·2 Kg/ha. of $K_2O$. (ii) Sandy loam. (iii) 4.6.61. (iv) (a) Ploughing, harrowing and levelling. (b) to (e) N.A. (v) 37 C.L./ha. of F.Y.M.+90 Kg/ha. of $P_2O_5$+90 Kg/ha. of $K_2O$. (vi) As per treatments. (vii) Irrigated. (viii) Bullock interculturing and hand weeding. (ix) 17·8 cm. (x) 24.9.61.

2. TREATMENTS :

**Main-plot treatments :**
2 varieties : $V_1$=Local (early), $V_2$=Deccan hybrid *makka* (late).

**Sub-plot treatments :**
3 row spacings : $S_1$=61 cm., $S_2$=76 cm. and $S_3$=91 cm.

**Sub-sub-plot treatments :**
3 levels of N : $N_1$=67·2, $N_2$=134 and $N_3$=202 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication, 3 sub-plots/main-plot, 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4 (iv) (a) N.A. (b) 9·2 m.×2·6 m. for $S_1$, 9·1 m.×3·1 m. for $S_2$, 9·1 m.×3·7 m. for $S_3$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Aphids—sprayed with Endrex 50 E.C. Folidol sprayed against cater pillar, 2 – 4, D sprayed to control weeds. (iii) Yield of grain. (iv) (a) 1961. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 5964 Kg/ha. (ii) (a) 1048·6 Kg/ha. (b) 628·2 Kg/ha. (c) 439·6 Kg/ha. (iii) Main effects of V, S and N are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $N_1$ | $N_2$ | $N_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $V_1$ | 8654 | 7605 | 7696 | 7710 | 7948 | 8297 | 7985 |
| $V_2$ | 4514 | 3853 | 3462 | 3686 | 3972 | 4171 | 3943 |
| Mean | 6584 | 5729 | 5579 | 5698 | 5960 | 6234 | 5964 |
| $N_1$ | 6147 | 5674 | 5274 | | | | |
| $N_2$ | 6649 | 5666 | 5567 | | | | |
| $N_3$ | 6956 | 5847 | 5896 | | | | |

C.D. for V marginal means=786·6 Kg/ha.
C.D. for S marginal means=395·1 Kg/ha.
C.D. for N marginal means=257·3 Kg/ha.

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**Crop :- Maize** (*Kharif*). **Ref :- Ms. 61(269), 62(107), 63(241).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'IM'.**

Object :—To find out the optimum water and manurial requirements for *Kharif* Maize.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Sunnhemp* for 61 and 62 ; Gram for 63. (c) Nil. (ii) Sandy loam. (iii) 8.6.61; 10.6.62; 6.6.63. (iv) (a) Ploughing and harrowing. (b) Hand dibbling for 61(269); N.A. for others. (c) N.A. (d) 91 cm. ×30 cm. for 61(269) ; N.A. for others. (e) 1 seed/hill for 61(269); N.A. for others. (v) 12·4 C.L./ha. of F.Y.M. for 61(269) ; 14·8 C.L./ha. of F.Y.M. for 62(107) and 17·3 C.L./ha. of F.Y.M. for 63(241). (vi) and (vii) As per treatments. (viii) Thinning, 2 interculturings and 1 to 2 weedings. (ix) 23·5 cm.; 23 cm. ; 22·9 cm. (x) 25.9.61 ; 13.9.62; 2.10.63.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 manurial treatments : $M_1$=Local Maize with 22·4 Kg/ha. of $P_2O_5$+11·2 Kg/ha. of $K_2O$, $M_2$=Deccan variety with 22·4 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$+11·2 Kg/ha. of $K_2O$, $M_3$=Deccan variety with 44·8 Kg/ha of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$ and $M_4$=Deccan variety. with 89·7 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of$K_2O$.

(2) 2 intensities of irrigation : $I_1$=6 and $I_2$=9 cm.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) 14·6 m.×26·8 m. for 61(269) and 62(107) ; N.A. for 63(241) (iii) 4. (iv) (a) 7·3 m.×6·7 m. (b) 5·5 m.×6·1 m. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Attack of aphids and rust. (iii) Yield of grain. (iv) (a) 1960 to 1962. (b) No. (c) As given under 5-Results. (v) and (vi) N.A. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 4161 Kg/ha. (ii) 497·5 Kg/ha. (based on 77 d.f. made up of pooled error and Treatments×years interaction). (iii) Effect of M is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $I_1$ | 3809 | 3898 | 4372 | 4775 | 4213 |
| $I_2$ | 3799 | 3639 | 4247 | 4752 | 4109 |
| Mean | 3804 | 3768 | 4309 | 4763 | 4161 |

C.D. for M marginal means=287·1 Kg/ha.

| Years | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Sig | $I_1$ | $I_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1961 | 4700 | 4244 | 5157 | 5151 | ** | 4719 | 4907 | N.S. | 4813 | 446·8 |
| 1962 | 2987 | 3606 | 3759 | 4428 | ** | 3777 | 3613 | N.S. | 3695 | 446·1 |
| 1963 | 3726 | 3456 | 4012 | 4711 | ** | 4144 | 3808 | N.S. | 3976 | 586·5 |
| Pooled | 3804 | 3768 | 4309 | 4763 | ** | 4213 | 4109 | N.S. | 4161 | 497·5 |

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**Crop :- Maize (*Rabi*).** **Ref :- Ms. 62(108).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'IM'.**

Object :— To find out optimum water and manurial requirements.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Maize. (c) 12·4 C.L./ha. of F.Y.M.+38·5 Kg/ha. of N as A/S+17·8 Kg/ha. of $P_2O_5$ as Super +13·6 Kg/ha. of $K_2O$ as Mur. Pot. (ii) Sandy loam, Brown Masari alkaline. (iii) 6.11.62. (iv) (a) Ploughing and harrowing. (b) to (e) N.A, (v) 17·3 C.L./ha. of F.Y.M. (vi) and (vii) As per treatments. (viii) Thinning, 2 interculturings, 2 to 3 weedings. (ix) 14 cm. (x) Local on 2,3.63 ; Deccan on 21.3.63.

### 2. TREATMENTS :

All combinations of (1) and (2).

(i) 4 manurial treatments : $M_1$=Local variety with 33·6 Kg/ha. of N+16·8 Kg/ha. of $P_2O_5$+16·8 Kg/ha. of $K_2O$, $M_2$=Deccan variety with 33·6 Kg/ha. of N+16·8 Kg/ha. of $P_2O_5$+16·8 Kg/ha. of $K_2O$, $M_3$=Deccan variety with 67·2 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+33·6 Kg/ha. of $K_2O$, and $M_4$=Deccan variety with 89·7 Kg/ha. of N+50·4 Kg/ha. of $P_2O_5$+50·4 Kg/ha of $K_2O$.

(2) 2 intensities of irrigation : $I_2$=6 and $I_2$=9 cm

### 3. DESIGN :

Same as in Expt. No. 61(106), 63 (242) given below.

### 4. GENERAL :

(i) Lodging was observed in local variety. (ii) Attack of aphids and rusts were found in local variety. (iii) Yield of grain. (iv) (a) 1961—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

### 5. RESULTS :

(i) 2221 Kg/ha. (ii) 244·7 Kg/ha. (iii) M effect is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $I_1$ | 1375 | 1914 | 2523 | 3125 | 2234 |
| $I_2$ | 1282 | 1970 | 2687 | 2893 | 2208 |
| Mean | 1328 | 1942 | 2605 | 3009 | 2221 |

C.D. for M marginal means=254·4 Kg/ha.

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**Crop :- Maize (*Rabi*).** **Ref :- Ms. 61(106), 63(242).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'IM'.**

Object :— To find out the optimum water and manurial requirement of Maize.

### 1, BASAL CONDITIONS :

(i) (a) Nil. (b) *Sannhemp*. (c) Nil. (ii) Black mixed kirl ; sandy loam. (iii) 27.10.61, 10.11.63. (iv) (a) Ploughing & harrowing. (b) to (e)N.A. (v) 403·5 Q/ha. of G.M. for 61(106); 17·3 C.L./ha. of F.Y.M. for 63(242). (vi) and (vii) As per treatments. (viii) Thinning, 2 interculturings and 3 weedings. (ix) 2 cm ; Nil. (x) 6.3.62 to 7.3.62 ; 3.3.64 and 30.3.64.

### 2· TREATMENTS :

All combinations of (1) and (2).

(1) 4 manurial treatments : $M_1$=3 way hybrid maize with 33·6 Kg/ha. of N+16·8 Kg/ha. of $P_2O_5$+16·8 Kg/ha. of $K_2O$, $M_2$=Deccan 1 variety with 33·6 Kg/ha. of N+16·8 Kg/ha. of $P_2O_5$+16·8 Kg/ha. of $K_2O$, $M_3$=Deccan 1 variety with 67·2 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+33·6 Kg/ha. of $K_2O$ and $M_4$=Deccan 1 variety with 100·9 Kg/ha. of N+50·4 Kg/ha. of $P_2O_5$+50·4 Kg/ha. of $K_2O$.

(2) 2 intensities of irrigation : $I_1$=6 and $I_2$=9 cm.

### 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 7·3 m.×6·7 m. (b) 6·1 m.×5·5 m. (v) 61 cm.×61 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961—1963 (Treatments were modified in 1962 only.) (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments × years interaction is absent.

5. RESULTS :

(i) 4539 Kg/ha. (ii) 443·8 Kg/ha. (based on 49 d.f. made up of Treatments × years interaction and pooled error). (iii) Main effect of M is significant. (iv) Av. yield of grain in Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $I_1$ | 3432 | 4189 | 4945 | 5461 | 4507 |
| $I_2$ | 3417 | 4487 | 4977 | 5406 | 4572 |
| Mean | 3424 | 4338 | 4961 | 5433 | 4539 |

C.D. for M marginal means=315·4 Kg/ha.

| Years | $I_1$ | $I_2$ | Sig. | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1961 | 5106 | 5139 | N.S. | 3984 | 4990 | 5733 | 5784 | ** | 5122 | 493·0 |
| 1963 | 3907 | 4004 | N.S. | 2864 | 3685 | 4189 | 5083 | ** | 3955 | 372·2 |
| Pooled | 4507 | 4572 | N.S. | 3424 | 4338 | 4961 | 5433 | * | 4539 | 443·8 |

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**Crop :- Maize (*Rabi*).** **Ref :- Ms. 60(277).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- '1M'.**

Object :—To find out optimum water and manurial requirements of 3 way hybrid Maize.

1. BASAL CONDITIONS :

(i) (a) G. M. (b) Sunnhemp. (c) Nil. (ii) Black mixed kirl (Alkaline patches). (iii) 22.10.60. (iv) (a) Ploughing, harrowing and levelling. (b) Dibbling. (c) N.A. (d) 45·7 cm. × 30·5 cm. (e) 2 seeds/hill thinned to one. (v) Nil. (vi) 3 way cross hybrid Maize (105 days). ($I_5 \times L_5 \times S_{23}$). (vii) As per treatments. (viii) Gap filling, thinning, interculturing and weeding. (ix) 8·3 cm. (x) 23.2.61.

2. TREATMENTS :

All combinations of (1) and (2).

(1) Two levels of irrigation : $I_1$=6 and $I_2$=9 cm.

(2) 5 manurial treatments : $M_0$=No manure. $M_1$=33·6 Kg/ha. of N as A/S and G.N.C. in 1 : 2 ratio. $M_2$=33·6 Kg/ha. of N as A/S+11·2 Kg/ha. of $P_2O_5$ as Super+11·2 Kg/ha. of $K_2O$ as Pot. Sul., $M_3$=69·2 Kg/ha. of N as A/S and G.N.C. in 1 : 2 ratio and $M_4$=69·2 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$.

Fertilzers applied in one dose 3 weeks after planting.

3. DESIGN :

(i) Fact. in R.B,D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 12·2 m. × 8·2 m. (b) 11·0 m. × 6·4 m. (v) 2 rows on all sides. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—'60. (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3607 Kg/ha, (ii) 609·7 Kg/ha. (iii) Main effect of M is significant. (iv) Av. yield of grain in Kg/ha.

| | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|---|
| $I_1$ | 2526 | 3836 | 3091 | 3656 | 3879 | 3398 |
| $I_2$ | 2934 | 3874 | 4287 | 3822 | 4169 | 3817 |
| Mean | 2730 | 3855 | 3689 | 3739 | 4024 | 3607 |

C.D. for M marginal means=739·5 Kg/ha.

**Crop :- Maize** (*Kharif*). **Ref :- Ms. 60(274).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'IM'.**

Object:— To find out the optimum water and manurial requirements for the Maize crop.

1. BASAL CONDITIONS:

(i) (a) *Jowar*—Gram. (b) Gram. (c) 12·4 C.L./ha. of F.Y.M.+22·4 Kg/ha. of N as A/s+22·4 Kg/ha. of $P_2O_5$ as Super. (ii) Sandy loam, brown Masari and Alluvial type. (iii) 1.6.60, (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) N.A. (d) 91 cm.×30 cm. (e) 2 to 3 seeds thinned to one. (v) F.Y.M. at 12·4 C.L./ha. applied by spreading and mixing. (vi) Hybrid maize. (vii) As per treatments. (viii) Interculturing, thinning and weeding. (ix) 19·6 cm. (x) 4.9.60.

2. TREATMENTS:

All combinations of (1) and (2).

(i) Two levels of irrigation : $I_1$=5 and $I_2$=8 cm.

(ii) 5 manurial treatments : $M_0$=No manure. $M_1$=22·4 Kg/ha. of N as A/S and G.N.C. in 1 : 2 ratio, $M_2$=22·4 Kg/ha. of N as A/S+11·2 Kg/ha. of $P_2O_5$+11·2 Kg/ha. of $K_2O$, $M_3$=44·8 Kg/ha. of N as A/S and G.N.C. in 1 : 2 ratio and $M_4$=44·8 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super+22·4 Kg/ha. of $K_2O$ as Pot. Sul.

Fertilizer applied 3 weeks after sowing by spreading and hoeing.)

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 7·3 m.×6·7 m. (b) 6·4 m.×6·1 m. (v) One row on all sides. (vi) Yes.

4. GENERAL:

(i) Fair. (ii) All thc of growth stage effected with *Helminthos Pharium turcicum* and leaf eating catter piller. Controlled by spraying Nicotine Sulphate and Goammaxene dust. (iv) (a) 1959—1960. (b) Yes. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 4450 Kg/ha. (ii) 278·7 Kg/ha. (iii) Main effect of M is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|---|
| $I_1$ | 3544 | 4669 | 4408 | 4768 | 4899 | 4457 |
| $I_2$ | 3892 | 4287 | 4434 | 4858 | 4741 | 4442 |
| Mean | 3718 | 4478 | 4421 | 4813 | 4820 | 4450 |

C.D. for M marginal means=338·1 Kg/ha.

**Crop :- Ragi (*Kharif*).** **Ref :- Ms. 62(52).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'M'.**

Object :— To find out the optimum levels of N, P and K with compost for *Ragi* under rainfed conditions in red soil area.

1. BASAL CONDITIONS :

(i) (a) *Ragi—Ragi*. (b) *Ragi*. (c) N.A. (ii) Red sandy loam. (iii) 7.8.62. (iv) (a) Ploughing with M B. plough. Passing cultivator 2 times, passing spike tooth and harrowing once. (b) Drilling. (c) 6 to 7 Kg/ha. (d) 30 cm.×15 cm. (v) 100·4 Q/ha. of compost. (vii) H-22 (late). (vii) Unirrigated. (viii) Passing *chippa kanti* 2 times, 2 weedings, 1 crop filling. (ix) 65 cm. (x) 20.12.62.

2. TREATMENTS :

4 manurial treatments ; $T_0$=Control, $T_1$=22·4 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$, $T_2$=44·8 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$ and $T_3$=67·2 Kg/ha. of N+67·2 Kg/ha. of $P_2O_5$+67·2 Kg/ha. of $K_2O$.

All manures applied in one dose at the time of drilling by broadcasting and mixing up with soil.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 5·0 m.×10·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) Tiller counts and yield of grain. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 1883 Kg/ha. (ii) 193·6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av. yield | 1116 | 1513 | 2090 | 2812 |

C.D.=238·2 Kg/ha.

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**Crop :- Ragi (*Kharif*).** **Ref :- Ms. 63(49).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'M'.**

Object :— To find the best combination of N, P and K for rainfed *Ragi*.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red sandy soil. (iii) 10.7.63. (iv) (a) N.A. (b) Drilling. (c) 6 to 7 Kg/ha. (d) 30 cm.×15 cm. (e) N.A. (v) 75·3 Q/ha. of compost at sowing. (vi) H-22 *Ragi*. (vii) Unirrigated. (viii) Thinning, gap filling and weeding. (ix) 60 cm. (x) 2.12.63.

2. TREATMENTS :

4 manurial treatments : $T_1$=22·4 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$, $T_2$=44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$, $T_3$=67·2 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$ and $T_4$=89·6 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$.

All N, P and K applied in one dose at drilling except for N in $T_4$ where N was applied in 2 doses, at drilling and 45 days after.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 6·6 m.×6·1 m. (b) 6·1 m.×5·5 m. (v) 26 cm.×30 cm. (vi) Yes.

### 4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) to (c) No. (v) to (vii) Nil.

### 5. RESULTS :

(i) 1814 Kg/ha. (ii) 188·1 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 1460 | 1606 | 2074 | 2115 |

C.D.=259·2 Kg/ha.

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**Crop :- Ragi (*Kharif*).** **Ref :- Ms. 64(66).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'M'.**

Object : – To study the range effect of the applications of N, P and K fertilizers to *Ragi* under dry land conditions.

### 1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Ragi.* (c) N.A. (ii) Red sand. (iii) 31.7.64. (iv) (a) 3 ploughings, passing cultivator and halube. (b) Sowing in lines by hand behind marker. (c) 5 Kg/ha. (d) 23 cm. between rows, (e) N.A. (v) Nil. (vi) H 22 (late). (vii) Unirrigated. (viii) 2 thinnings and 2 weedings. (ix) N.A. (x) First week of December, 1964.

### 2. TREATMENTS :

9 manurial treatments : $T_1$=0, $T_2$=33·6 Kg/ha. of N, $T_3$=67·2 Kg/ha. of N, $T_4$=33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$, $T_5$=67·2 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$, $T_6$=33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$, $T_7$=67·2 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$, $T_8$=56 Q/ha. of F.Y.M. and $T_9$=33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha, of $K_2O$+56 Q/ha. of F.Y.M.

N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot. F.Y.M. applied one month before drilling. N, P and K broadcasted and mixed with the soil at the time of drilling.

### 3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) 43·6 m.×11·3 m. (iii) 3. (iv) (a) 11·3 m.×4·6 m. (b) 10·2 m.×4·0 m. (v) 53 cm.×30 cm. (vi) Yes.

### 4. GENERAL :

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) No. (v) to (vii) Nil.

### 5. RESULTS :

(i) 1150 Kg/ha. (ii) 449·8 Kg/ha. (iii) Treament differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 1053 | 1025 | 1226 | 1153 | 1617 | 1034 | 1306 | 934 | 1006 |

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**Crop :- Ragi (*Kharif*).** **Ref :- Ms. 63(64), 64(56).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'M'.**

Object :— To find the effect of P and K in combination with N on the yield of *Ragi*.

1. BASAL CONDITIONS :

(i) (a) Groundnut—*Ragi*. (b) *Ragi*, Groundnut. (c) Nil. (ii) Red sandy soil. (iii) 15, 16.7.63 ; 16.7.64. (iv) (a) N.A. (b) Drilling ; Dibbling. (c) 6 to 7 Kg/ha. (d) 30 cm. × 15 cm. (e) N.A. (v) 9·9 C.L./ha. of F.Y.M. (vi) H-22. (vii) Unirrigated. (viii) Hand weeding and gap-filling. (ix) 60 cm. ; 89 cm. (x) 25.11.63 to 2.12.63 ; 2.12.64.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1) and (2).

(1) 3 levels of $P_2O_5$ as Super : $P_0=0$, $P_1=22·4$ and $P_2=44·8$ Kg/ha.

(2) 3 levels of $K_2O$ as Mur. Pot. : $K_0=0$, $K_1=22·4$ and $K_2=44·8$ Kg/ha.

**Sub-plot treatments :**

5 levels of N as A/S : $N_0=0$, $N_1=22·4$, $N_2=44·8$, $N_3=67·2$ and $N_4=89·6$ Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication, 5 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 6·6 m. × 4·6 m. (b) 5·5 m. × 3·7 m. (v) 54 cm. × 45 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Slight attack of blast in 63(64). (iii) Yield of grain. (iv) (a) 1963—1964 (b) No. (c) Nil. (v) Mandya. (vi) Nil. (vii) Main plot variances are heterogeneous and Treatments × years interaction is absent. Hence the results of individual years are presented under 5. Results.

5. RESULTS :

63(64)

(i) 2489 Kg/ha. (ii) (a) 556·9 Kg/ha. (b) 368·9 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $N_4$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $K_0$ | 2300 | 2423 | 2640 | 1507 | 2129 | 2484 | 2912 | 3240 | 2454 |
| $K_1$ | 2355 | 2678 | 2516 | 1694 | 2167 | 2485 | 3038 | 3197 | 2516 |
| $K_2$ | 2242 | 2475 | 2776 | 1613 | 2125 | 2680 | 2828 | 3242 | 2498 |
| Mean | 2299 | 2525 | 2644 | 1604 | 2140 | 2550 | 2926 | 3226 | 2489 |
| $N_0$ | 1329 | 1693 | 1792 | | | | | | |
| $N_1$ | 1965 | 2148 | 2308 | | | | | | |
| $N_2$ | 2334 | 2560 | 2755 | | | | | | |
| $N_3$ | 2838 | 2905 | 3034 | | | | | | |
| $N_4$ | 3027 | 3320 | 3333 | | | | | | |

C.D. for N marginal means=245·5 Kg/ha.

64(56)

(i) 1243 Kg/ha. (ii) (a) 273·2 Kg/ha. (b) 411·4 Kg/ha. (iii) Main effect of P is significant. N effect is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $N_4$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $K_0$ | 1225 | 1271 | 1245 | 912 | 1027 | 1273 | 1449 | 1581 | 1247 |
| $K_1$ | 1060 | 1266 | 1311 | 964 | 1057 | 1164 | 1422 | 1455 | 1212 |
| $K_2$ | 1156 | 1235 | 1416 | 972 | 961 | 1257 | 1421 | 1733 | 1269 |
| Mean | 1147 | 1257 | 1324 | 949 | 1013 | 1231 | 1431 | 1590 | 1243 |
| $N_0$ | 840 | 1010 | 998 | | | | | | |
| $N_1$ | 988 | 971 | 1079 | | | | | | |
| $N_2$ | 1119 | 1268 | 1308 | | | | | | |
| $N_3$ | 1339 | 1429 | 1524 | | | | | | |
| $N_4$ | 1450 | 1608 | 1713 | | | | | | |

C.D. for P marginal means=122·1 Kg/ha.

C.D. for N marginal means=223·4 Kg/ha.

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**Crop :- Ragi (*Kharif*).** **Ref :- Ms. 63(63).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'M'.**

Object :—To find out the effect of P and K in combination with N on the yield of *Ragi.*

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Ragi.* (c) Nil. (ii) Red sandy soil. (iii) 15, 16.7.63. (iv) (a) N.A. (b) Dibbling. (c) 6 to 7 Kg/ha. (d) 30 cm. × 15 cm. (e) N.A. (v) 19·8 C.L./ha. of F.Y.M. spread evenly and mixed 2 weeks before sowing. (vi) H.—22. (vii) Unirrigated. (viii) Hand thinning and gap filling. (ix) 60 cm. (x) 25.11.63 to 2.12.63.

2. TREATMENTS :

Same as in expt. no. 63(64) on page 259.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication, 5 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 6·6 m. × 4·6 m. (b) 5·5 m. × 3·7 m. (v) 54 cm. × 46 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Slight attack of blast. No control measures takan. (iii) Plant height, grain yield and No. of tillers. (iv) (a) 1963—only. (b) No. (c) Nil. (v) Mandya and Hagari. (vi) and (vii) Nil.

5. RESULTS :

(i) 2462 Kg/ha. (ii) (a) 253·5 Kg/ha. (b) 337·0 Kg/ha. (iii) N is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $N_4$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $K_0$ | 2344 | 2544 | 2420 | 1486 | 2034 | 2597 | 2875 | 3187 | 2436 |
| $K_1$ | 2394 | 2434 | 2630 | 1544 | 2109 | 2566 | 2981 | 3231 | 2486 |
| $K_2$ | 2517 | 2408 | 2463 | 1425 | 2062 | 2562 | 2981 | 3283 | 2463 |
| Mean | 2418 | 2462 | 2504 | 1485 | 2068 | 2575 | 2946 | 3233 | 2462 |
| $N_0$ | 1393 | 1475 | 1587 | | | | | | |
| $N_1$ | 2028 | 2031 | 2146 | | | | | | |
| $N_2$ | 2595 | 2599 | 2531 | | | | | | |
| $N_3$ | 2898 | 3043 | 2896 | | | | | | |
| $N_4$ | 3179 | 3160 | 3361 | | | | | | |

C.D. for N marginal mnans=228·0 Kg/ha.

**Crop :- Ragi.** **Ref :- Ms. 60(17), 61(64).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of *Ragi.*

1. BASAL CONDITIONS :

(i) (a) *Ragi*—Groundnut—*Ragi.* (b) Groundnut. (c) 11·2 Kg/ha. of $P_2O_5$, Nil. (ii) Red soil (sandy loam). (iii) 25.6.60, 11.7.61. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 7 Kg/ha. (d) 25 cm. between rows. (e) N.A. (v) 5604 Kg/ha. of F.Y.M. incorporated in soil by working cultivator a fortnight before sowing. (vi) H—22. (vii) Unirrigated. (viii) 2 thinning cum interculturings and 2 to 3 hand weedings. (ix) 57 cm., 73 cm. (x) 15.11.60; 27.11.61.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1) and (2)

(1) 2 levels of N as A/S: $N_1=16·8$ and $N_2=33·6$ Kg/ha.
(2) 2 levels of $P_2O_5$ as Super : $P_1=16·8$ and $P_2=33·6$ Kg/ha.

**Sub-plot treatments :**

2 levels of $K_2O$ as Mur. Pot. : $K_0=0$, $K_1=16·8$ and $K_2=33·6$ Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 6·7 m. × 5·8 m. for 60(17) and 8·8 m, × 6·1 m. for 61(64). (v) Nil. (vi) Yes.

4. GENERAL :

(i) General. (ii) Nil. (iii) Periodical tiller counts. height measurements and yield of grain. (iv) (a) 1959—61 (1959 N.A). (b) No. (c) Nil. (v) and (vi) Nil. (vii) Main-plot as well as sub-plot error variances are heterogeneous .

5. RESULTS :

60(17)

(i) 675 Kg/ha. (ii) (a) 138·8 Kg/ha. (b) 95·4 Kg/ha. (iii) None of the effect is significant. (iv) Av. yield of grain in Kg/ha.

| | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|
| $N_1$ | 679 | 642 | 657 | 668 | 656 | 660 |
| $N_2$ | 704 | 676 | 629 | 716 | 724 | 690 |
| Mean | 692 | 659 | 643 | 692 | 690 | 675 |
| $K_0$ | 674 | 613 | | | | |
| $K_1$ | 716 | 668 | | | | |
| $K_2$ | 685 | 696 | | | | |

**61(64)**

(i) 3424 Kg/ha. (ii) 636·4 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in Kg/ ha.

| | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|
| $N_1$ | 3125 | 3682 | 3425 | 3336 | 3451 | 3404 |
| $N_2$ | 3244 | 3645 | 3385 | 3409 | 3540 | 3444 |
| Mean | 3184 | 3664 | 3404 | 3373 | 3495 | 3424 |
| $K_0$ | 3097 | 3712 | | | | |
| $K_1$ | 3254 | 3491 | | | | |
| $K_2$ | 3202 | 3788 | | | | |

C.D. for N marginal means=319·6 Kg/ha.

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**Crop :- Ragi.** **Ref :- Ms. 60 (23), 61(69).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'M'.**

Object :—To compare the efficacy of inorganic fertilizers containing N, P and K with compost in increasing the yield of *Ragi*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Ragi*. (c) 100·4 Q/ha. of F.Y.M. in 60(23) and 75·3 Q/ha. of compost in 61(69). (ii) Sandy soil. (iii) 16.7.60; 19.7.61. (iv) (a) 3 to 4 ploughings, (b) Drilling. (c) 7 Kg/ha. (d) 25 cm. between rows. (e) N.A. (v) Nil. (vi) H—22. (vii) Unirrigated. (viii) Thinning of the crop by the local implement weeding and propping. (ix) 56 cm., 72 cm. (x) 24.11.60; 22.11.61.

2. TREATMENTS ;

6 manurial treatments : $T_0$=Control, $T_1$=Compost at 100·4 Q/ha., $T_2$=NPK equivalent to 100·4 Q/ha. of Compost, $T_3$=75·3 Q/ha. of Compost+NPK equivalent to 25·1 Q/ha. of Compost, $T_4$=50·2 Q/ha. of Compost+NPK equivalent to 50·2 Q/ha. of Compost and $T_5$= 25·1 Q/ha. of Compost+NPK equivalent to 75·3 Q/ha. of Compost.

Compost applied 15 to 20 days before drilling.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 40·2 m.×24·4 m. for 60(23), 26·8 m.×36·6 m. (iii) 4. (iv) (a) 13·4 m.×12·2 m. (b) 12·8 m.×11·6 m. for 60(23); 13·1 m.×11·9 m. (v) 30 cm.×30 cm. for 60(23); 15 cm.×15 cm. (vi) Yes.

4. GENERAL :

(i) Crop has lodged to some extent in plots which had received combined doses of manure and fertilizer in 60(23). Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960—61. (b) No. (c) Results of combined analysis are given under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous.

5 RESULTS :

(i) 1813 Kg/ha. (ii) 303·8 Kg/ha. (based on 5 d.f. made up of Treatments × years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1360 | 1412 | 1719 | 1954 | 2130 | 2305 |

C.D.=310·2 Kg/ha.

| Years | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|
| 1960 | 1374 | 1400 | 1982 | 2158 | 2291 | 2423 | ** | 1938 | 204·0 |
| 1961 | 1347 | 1423 | 1456 | 1750 | 1969 | 2187 | ** | 1689 | 163·6 |
| Pooled | 1360 | 1412 | 1719 | 1954 | 2130 | 2305 | ** | 1813 | 303·8 |

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**Crop :- Ragi.** **Ref :- Ms. 60(22), 61(71).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'M'.**

Object :—To find out the best time and method of application of fertilisers to *Ragi*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Ragi.* (c) 75·3 Q/ha. of F.Y.M. in 60(22), 12·4 C.L./ha. of Compost+22·4 Kg/ha. of $P_2O_5$ in 61(71). (ii) Sandy soil. (iii) 26.6.60; 19.7.61. (iv) (a) 3 ploughings. (b) Drilling. (c) 6 to 7 Kg/ha. (d) 30 cm. between rows for 60(22); 25 cm. between rows in 61(71). (e) N.A. (v) 22·4 Kg/ha. of $P_2O_5$+75·3 Q/ha. of Compost. (vi) H—22. (vii) Unirrigated. (viii) Weedings and thinning. (ix) 56 cm.; 73 cm. (x) 19.11.60; 4.12.61.

2. TREATMENTS :

All combinations ot (1) and (2)

(1) 3 times of application of N : $T_1$=At sowing, $T_2=\frac{1}{2}$ at sowing+$\frac{1}{2}$ at one month later and $T_3$=A month after sowing.

(2) 2 methods of application of N : $M_1$=By broadcast and $M_2$=By drilling.

N applied as A/S at 22·4 Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 14·0 m.×14·0 m. for 60(22); 14·0 m.×7·3 m. for 61(71). (b) 13·4 m.×13·4 m. for 60(22); 13·7 m.×7·0 m. for 61(71). (v) 30 cm.×30 cm. for 60(22); 15 cm.× 15 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of white ants in 60(22); Nil for 61(71). (iii) Yield of grain. (iv) (a) 1960—62 (modified in 62). (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent.

5. RESULTS :

**60(22)**

(i) 1567 Kg/ha. (ii) 102·9 Kg/ha. (iii) Main effects of M and T and M×T interaction are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $T_1$ | $T_2$ | $T_3$ | Mean |
|---|---|---|---|---|
| $M_1$ | 1243 | 1467 | 1414 | 1375 |
| $M_2$ | 1450 | 1579 | 2250 | 1760 |
| Mean | 1346 | 1523 | 1832 | 1567 |

C.D. for T marginal means=109·7 Kg/ha.
C.D. for M marginal means=89·5 Kg/ha.
C.D for body of table =154·9 Kg/ha.

**61(71)**

(i) 2201 Kg/ha. (ii) 205·7 Kg/ha. (iii) Main effects of T and M are highly significant. Interaction T×M is significant. (iv) Av. yield of grain in Kg/ha.

| | $T_1$ | $T_2$ | $T_3$ | Mean |
|---|---|---|---|---|
| $M_1$ | 1887 | 2182 | 2064 | 2044 |
| $M_2$ | 2123 | 2241 | 2712 | 2359 |
| Mean | 2005 | 2211 | 2388 | 2201 |

C.D. for T marginal means=219·0 Kg/ha.
C.D. for M marginal means=179·0 Kg/ha.
C.D. for body of table =309·7 Kg/ha.

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**Crop :- Ragi (*Kharif*).** **Ref :- Ms. 62(49).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'M'.**

Object : – To find out suitable time and method of application of fertilizers to *Ragi* crop under rainfed conditions.

1. BASAL CONDITIONS :

(i) (a) *Ragi* after *Ragi*. (b) *Ragi*. (c) 33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+73·3 Q/ha. of compost. (ii) Sandy soil. (iii) 4.8.62. (iv) (a) 3 ploughings with M.B. plough. Passing K.M. cultivator twice and passing halube twice. (b) Drilling. (c) 6 to 7 Kg/ha. (d) 30 cm.×15 cm. (e) N.A. (v) 33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+75·3 Q/ha. of compost. (vi) H-22 (medium and late). (vii) Unirrigated. (viii) Passing with chippa kunti. 3 weedings. (ix) 67 cm. (x) 19.12.62.

2. TREATMENTS :

Same as in Expt. No. 60(22) on page 263.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) 28·0 m.×21·9 m. (iii) 4. (iv) (a) 14·0 m.×7·3 m. (b) 13·7 m.×7·0 m. (v) 15 cm.×15 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Height of mothes shoot, no. of tilliers and yield of grain. (iv) (a) 1960—1962 (modified in1962). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1018 Kg/ha. (ii) 75·3 Kg/ha. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $T_1$ | $T_2$ | $T_3$ | Mean |
|---|---|---|---|---|
| $M_1$ | 936 | 988 | 910 | 945 |
| $M_2$ | 1040 | 1144 | 1092 | 1092 |
| Mean | 988 | 1066 | 1001 | 1018 |

C.D. for M marginal means=65·5 Kg/ha.

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**Crop :- Ragi.** **Ref :- Ms. 64(163), 64(162).**

**Site :- Agri. Res. Stn., Hiriyur.** **Type :- 'M'.**

Object :— To study the effect of N, P and K on the yield of dry land Ragi.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Black soil. (iii) 26.7.64 ; 14.8.64. (iv) (a) 3 ploughing. (b) Drill sown—Transplanted. (c) 5 to 6 Kg/ha. (d) 23 cm. between rows. (e) Nil. (v) 5 C.L./ha. of compost or F.Y.M. (vi) H 22 ; Poorna. (vii) Unirrigated. (viii) Weeding and harrowing. (ix) 37·3 cm. (x) 28.11.64, 19.11.64.

2. TREATMENTS :

All combinations of (1), (2) and (3).

(1) 3 levels of N : $N_0=0$, $N_1=33·6$ and $N_2=67·3$ Kg./ha.

(2) 3 levels of $P_2O_5$ : $P_0=0$, $P_1=22·4$ and $P_2=44·8$ Kg/ha.

(3) 3 levels of $K_2O$ : $K_0=0$, $K_1=22·4$ and $K_2=44$ 8 Kg/ha.

3. DESIGN :

(i) $3^3$ Confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A, (iii) 2. (iv) (a) 9·8 m.×6·4 m. (b) 7·9 m.×5·2 m. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of grain. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

64(163)

(i) 696 Kg/ha. (ii) 148·3 Kg/ha. (iii) Main effects of N and K are highly significant. Interaction P×K is significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 439 | 394 | 504 | 558 | 382 | 396 | 446 |
| $N_1$ | 627 | 775 | 657 | 797 | 630 | 633 | 687 |
| $N_2$ | 964 | 956 | 945 | 1066 | 947 | 852 | 955 |
| Mean | 677 | 708 | 702 | 807 | 653 | 627 | 696 |
| $K_0$ | 686 | 862 | 873 | | | | |
| $K_1$ | 763 | 618 | 579 | | | | |
| $K_2$ | 581 | 645 | 655 | | | | |

C.D. for N or K marginal means=102·4 Kg/ha.
C.D. for body of N×K table=177·5 Kg/ha.

**64(162)**

(i) 695 Kg/ha. (ii) 166·4 Kg/ha. (iii) Main effects of N, K and interaction N×K are significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 576 | 556 | 552 | 772 | 524 | 387 | 561 |
| $N_1$ | 756 | 671 | 724 | 781 | 656 | 715 | 717 |
| $N_2$ | 722 | 913 | 787 | 892 | 734 | 796 | 807 |
| Mean | 685 | 713 | 688 | 815 | 638 | 633 | 695 |
| $K_0$ | 989 | 781 | 675 | | | | |
| $K_1$ | 467 | 666 | 781 | | | | |
| $K_2$ | 598 | 693 | 607 | | | | |

C.D. for N or K marginal means=115·0 Kg/ha.
C.D. for body of N×K table=199·2 Kg/ha.

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**Crop :- Ragi.** **Ref :- Ms. 63(200), 64(159), 65(50).**

**Site :- Agri. Res. Stn., Hiviyur.** **Type :- 'M'.**

Object :— To study the effect of N, P and K on Ragi under irrigated conditions.

1. BASAL CONDITIONS :

(i) (a) N.A. for 63 and 64 ; Napier grass—Paddy—*Ragi* for 65. (b) N.A. for 63 and 64 ; Paddy for 65. (c) N.A. for 63 and 64 ; 67·2 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+33·6 Kg/ha. of $K_2O$. (ii) Black soil. (iii) N.A. ; 28.2.64 ; 4.4.65. (iv) (a) 3 ploughings for 63 and 64 ; 3 ploughings, 2 harrowings and passing cultivator once for 65. (b) Transplanting. (c) 11 to 13 Kg/ha. for 63 and 64 ; 7 Kg/ha. for 65, (d) 23 cm. between rows for 63 ahd 64 ; 23 cm.×10 cm. for 65. (e) N.A. (v) 12·4 C.L./ha. of F.Y.M. (vi) Poorna. (vii) Irrigated. (viii) Weeding and interculturing. (ix) 11·2 cm. ; 2·8 cm. ; 4·5 cm. (x) N.A. ; 20.5.64 ; 21.6.65 and 8.7.65.

2. TREATMENTS :

All combinations of (1), (2) and (3).
(1) 3 levels of N : $N_0$=0, $N_1$=33·6 and $N_2$=67·2 Kg/ha.
(2) 3 levels of $P_2O_5$ : $P_0$=0, $P_1$=22·4 and $P_2$=44·8 Kg/ha.
(3) 3 levels of $K_2O$ : $K_0$=0, $K_1$=22·4 and $K_2$=44·8 Kg/ha.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 9·8 m.×6·4 m. (b) 7·9 m.×5·2 m. (v) 4 rows. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (b) Nil. (iii) Yield of grain. (iv) (a) 1963—66. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

**63(200)**

(i) 704 Kg/ha, (ii) 183·2 Kg/ha. (iii) Main effect of N is significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 521 | 698 | 579 | 612 | 615 | 572 | 600 |
| $N_1$ | 711 | 817 | 679 | 763 | 753 | 691 | 736 |
| $N_2$ | 802 | 658 | 870 | 745 | 853 | 731 | 777 |
| Mean | 678 | 724 | 709 | 707 | 741 | 664 | 704 |
| $K_0$ | 638 | 753 | 730 | | | | |
| $K_1$ | 743 | 719 | 760 | | | | |
| $K_2$ | 654 | 702 | 638 | | | | |

C.D. for N marginal means=126·6 Kg/ha.

**64**(159)

(i) 2305 Kg/ha. (ii) 238·4 Kg/ha. (iii) Main effects of N, P and K are highly significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 2329 | 1939 | 1840 | 1657 | 1879 | 2571 | 2036 |
| $N_1$ | 2632 | 2084 | 2120 | 1889 | 2160 | 2786 | 2278 |
| $N_2$ | 2935 | 2555 | 2313 | 2087 | 2582 | 3134 | 2601 |
| Mean | 2632 | 2193 | 2091 | 1877 | 2207 | 2831 | 2305 |
| $K_0$ | 2220 | 1788 | 1624 | | | | |
| $K_1$ | 2450 | 2124 | 2047 | | | | |
| $K_2$ | 3225 | 2664 | 2602 | | | | |

C.D. for N, P or K marginal means=164·8 Kg/ha.

**65**(50)

(i) 1921 Kg/ha. (ii) 292·6 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 1691 | 1651 | 1590 | 1549 | 1803 | 1580 | 1644 |
| $N_1$ | 2092 | 1775 | 1909 | 2010 | 1876 | 1890 | 1925 |
| $N_2$ | 2162 | 2114 | 2308 | 2100 | 2208 | 2275 | 2194 |
| Mean | 1982 | 1846 | 1936 | 1886 | 1962 | 1915 | 1921 |
| $K_0$ | 1997 | 1742 | 1920 | | | | |
| $K_1$ | 2054 | 1808 | 2024 | | | | |
| $K_2$ | 1893 | 1989 | 1862 | | | | |

C.D, for N marginal means=202·3 Kg/ha.

**Crop :- Ragi** (*Rabi*). **Ref. :- Ms. 62, 63 (S.F.T.).**

**Site :- (District) : Mysore.** **Type :- 'M'.**

Object :—Type $A_1$—To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red sandy. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :
O =Control (no manure).
$N_1$ =35 Kg/ha. of N.
$N_2$ =70 Kg/ha. of N.
$P_1$ =35 Kg/ha. of $P_2O_5$.
$N_1P_1$ =35 Kg/ha. of N+35 Kg/ha. of $P_2O_5$.
$N_2P_1$ =70 Kg/ha. of N+35 Kg/ha. of $P_2O_5$
$N_2P_2$ =70 Kg/ha. of N+ 70 Kg/ha. of $P_2O_5$
$N_2P_2K_1$=70 Kg/ha. of N+70 Kg/ha. of $P_2O_5$ + 35 Kg/ha. of $K_2O$
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

A selected district is divided into four agriculturally homogeneous zones based on climate, soil, cropping pattern etc. In each zone one block is selected at random. A block normally consists of a group of 50-100 villages. In each block 36 experiments are conducted in a year of which 11 are of type $A_1$, 11 of type $A_2$, 11 of type $A_3$ and 3 are of type C. The eleven experiments under type $A_1$, $A_2$ and $A_3$ are distributed as 3 on a *Kharif* cereal, 3 on a *rabi* cereal, 3 on a cash crop and 2 on oil seed. All the three type-C experiments are conducted on a legume crop. For the purpose of conducting the $A_1$, $A_2$ and $A_3$ experiments 11 villages are randomly selected in each block and in each village 3 experiments one each of type $A_1$, $A_2$ and $A_3$ are laid out. For conducting the three type-C trials three villages are randomly selected in each block.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962 to 1966 [1964 and 1965 N.A.]. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

62(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 224 | 288 | 407 | 540 | 573 | 308 | 937 | 140·2 |

Control yield=1130 Kg/ha. ; No. of trials=5.

63(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 14 | 21 | 16 | 72 | 79 | 92 | 102 | 12·6 |

Control yield=245 Kg/ha. ; No. of trials=3.

* * *

**Crop :- Ragi** (*Kharif*). **Ref :- Ms. 64,65(S.F.T.) for Mandya and Mysore and 64 (S.F.T.) for others.**

**Site :- (District) : Banglore, Hassan, Mandya, Mysore, N. Kanara and Shimoga.** **Type :- 'M'.**

Object :—Type $A_1$ : To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red loamy for Banglore, Laterite for N. Kanara and Red sandy for others. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in Type $A_1$ (Rabi Irrigated) on page 268.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1964 to 1966 for Mandya and Mysore ; 1964 only for Shimoga ; 1964 to 1966 [1965 N.A.] for others. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**Banglore**

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 262 | 485 | 239 | 656 | 621 | 820 | 903 | 106·9 |

Control yield=1969 Kg/ha. ; No. of trials=18.

**Hassan**

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | —47 | 162 | −58 | 81 | 352 | 441 | 342 | 73·2 |

Control yield=1140 Kg/ha.; No. of trials=4.

**Mandya**

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 469 | 389 | 329 | 498 | 518 | 407 | 630 | 190·8 |

Control yield=2854 Kg/ha. ; No. of trials=7.

65(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 225 | 400 | 150 | 275 | 475 | 750 | 600 | 95·0 |

Control yield=2025 Kg/ha. ; No. of trials=3.

**Mysore**

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | —367 | —320 | —469 | —282 | —232 | —161 | 7 | 184·3 |

Control yield=1630 Kg/ha. ; No. of trials=9.

65(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 520 | 400 | 400 | 400 | 820 | 640 | 1080 | 0·0 |

Control yield=2609 Kg/ha. ; No. of trials=1.

N. Kanara

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 256 | 434 | 336 | 553 | 474 | 948 | 1067 | 0·0 |

Control yield=2609 Kg/ha. ; No. of trials=1.

Shimoga

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 131 | 271 | 158 | 372 | 382 | 692 | 635 | 120·0 |

Control yield=591 Kg/ha. ; No. of trials=3.

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**Crop :- Ragi** (*Rabi*). **Ref :- Ms. 62, 63 (S.F.T.).**

**Site :- (District) : Mysore.** **Type :- 'M'.**

Object :— Type : $A_2$ To study the response curves of important cereal, cash and oilseed crops to phosphorus applied singly and in combination with others nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red sandy. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :

O =Control (no manure).

$N_1$ =35 Kg/ha. of N.

$P_1$ =35 Kg/ha. of $P_2O_5$.

$P_2$ =70 Kg/ha. of $P_2O_5$.

$N_1P_1$ =35 Kg/ha. of N+35 Kg/ha. of $P_2O_5$.

$N_1P_2$ =35 Kg/ha. of N+70 Kg/ha. of $P_2O_5$.

$N_2P_2$ =70 Kg/ha. of N+ 70Kg/ha. of $P_2O_5$.

$N_2P_2K_2$=70 Kg/ha of N+70 Kg/ha. of $P_2O_5$+70 Kg/ha. of $K_2O$.

N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in Type $A_1$ (Rabi) on page 268.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962 to 1963. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

62(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 415 | 676 | 764 | 994 | 691 | 972 | 1117 | 280·5 |

Control yield=880 Kg/ha ; No. of trials=4.

63(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 20 | 25 | 23 | 57 | 57 | 63 | 81 | 10·0 |

Control yield=256 Kg/ha ; No. of trials=3.

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**Crop :- Ragi (*Kharif*).** **Ref :- Ms. 64, 65 (S.F.T.) for Mandya,**
**64(S.F.T.) for Banglore, Hassan**
**Mysore and Shimoga.**

**Site :- (District) : Banglore, Hassan,**
**Mandya, Mysore and Shimoga.** **Type :- 'M'.**

Object :—Type $A_2$ : To study the response curves of important cereal, cash and oilseed crops to phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red loamy for Banglore and Red sandy for others. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as Type $A_2$ (Rabi) on page 270.

4. GENERAL :

(i) to (iii) N.A. (iv) 1964 only for Shimoga ; 1964 to 1966 [1965 N.A. for Banglore and Hassan] for others. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**Banglore**

62(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 233 | 65 | 331 | 361 | 558 | 818 | 957 | 159·0 |

Control yield=1951 Kg/ha ; No. of trials=17.

**Hassan**

64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 90 | 153 | 181 | 127 | 336 | 404 | 553 | 60·7 |

Control yield=1009 Kg/ha ; No. of trials=9.

**Mandya**

64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 247 | 247 | 420 | 333 | 494 | 599 | 728 | 91·0 |

Control yield=3162 Kg/ha. ; No. of trials=6.

**65(S.F.T.)**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 200 | 0 | 275 | 100 | 250 | 400 | 450 | 103·9 |

Control yield= 1800 Kg/ha. ; No. of trials=2.

**Mysore**

**64(S.F.T.)**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 331 | 247 | 327 | 479 | 535 | 668 | 878 | 72·8 |

Control yield=1023 Kg/ha. ; No. of trials=9.

**Shimoga**

**64(S.F.T.)**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 95 | 87 | 135 | 351 | 469 | 570 | 616 | 72·3 |

Control yield=617 Kg/ha. ; No. of trials=3.

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**Crop :- Ragi (*Rabi*).** **Ref :- Ms. 62, 63 (S.F.T.)**

**Site :- (District) : Mysore.** **Type :- 'M'.**

Gbject:—Type $A_2$: To study the response curves of important cereal, cash and oilseed crops to potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red sandy. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments

O =Control (no manure)
$N_1$ =35 Kg/ha of N
$K_1$ =35 Kg/ha of $K_2O$.
$K_2$ =70 Kg/ha of $K_2O$.
$N_1K_1$ =35 Kg/ha of N+35 Kg/ha of $K_2O$.
$N_1K_2$ =35 Kg/ha of N+70 Kg/ha of $K_2O$.
$N_2K_2$ =70 Kg/ha of $P_2O_5$+70 Kg/ha of $K_2O$.
$N_1P_1K_1$ =35 Kg/ha of N+35 Kg/ha of $P_2O_5$+35 Kg/ha of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in Type $A_1$ (Rabi) on page 268.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962 to 1963. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**62(S.F.T.)**

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 225 | 372 | 203 | 628 | 557 | 873 | 1078 | 102·5 |

Control yield=639 Kg/ha.; No. of trials=5.

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 21 | 15 | 15 | 68 | 66 | 74 | 75 | 11·5 |

Control yield=259 Kg/ha. ; No. of trials=3.

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**Crop :- Ragi (*Kharif*).** **Ref :- Ms. 64 (S.F.T.) Banglore, Mysore, Hassan and Shimoga and 64, 65 (S.F.T.) for Mandya.**

**Site :- (District) : Banglore, Hassan, Mandya, Mysore and Shimoga.** **Type :- 'M'.**

Object :—Type$_3$ : To study the response curves of important cereal, cash and oilseed crops to potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red loamy for Banglore and Red sandy for others. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as Type A$_3$ (Rabi) on page 272.

4. GENERAL :

(i) to (iii) N.A. (iv) 1964—only for Shimoga ; 1964 to 1965 [1965 N.A.] for Mysore; 1964 to 1966 [1965 N.A. for Banglore and Hassan] for others. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

**Banglore**

**64(S.F.T.)**

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 265 | 220 | 239 | 418 | 504 | 665 | 728 | 88·9 |

Control yield=1898 Kg/ha. ; No. of trials=18.

**Hassan**

**64(S.F.T.)**

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 96 | 198 | 63 | 188 | 206 | 300 | 168 | 48·2 |

Control yield=964 Kg/ha. ; No. of trials=4.

**Mandya**

**64(S.F.T.)**

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 329 | 222 | 300 | 325 | 564 | 477 | 636 | 106·7 |

Control yield=3377 Kg/ha. ; No. of trials=7.

65(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 533 | 300 | 233 | 733 | 366 | 533 | 900 | 161·9 |

Control yield=2233 Kg/ha. ; No. of trials=3.

**Mysore**

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 77 | −48 | −77 | 201 | 148 | 304 | 511 | 50·0 |

Control yield=1269 Kg/ha. ; No. of trials=9.

**Shimoga**

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of grain in Kg/ha. | 141 | −7 | 132 | 322 | 266 | 467 | 630 | 177·8 |

Control yield=524 Kg/ha. ; No. of trials=3.

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**Crop :- Ragi (*Kharif*).** **Ref :- Ms. 61(66).**

**Site :- Agri. College, Hebbal.** **Type :- 'C'.**

Object .—To find out which of the green manure crop when ploughed in *situ* would give the highest yield.

1. BASAL CONDITIONS :

(i) (a) No. (b) *Ragi.* (c) 14·8 C.L./ha. of Compost. (ii) N.A. (iii) 4.8.61. (iv) (a) 3 ploughings, harrowings, sowing G.M. (b) Drilling. (c) 7 Kg/ha. (d) 25 cm. between rows. (e) Nil. (v) 112·1 Kg/ha. of $P_2O_5$ as Super applied to G.M. crop as basal dose. (vi) H—22 (late). (vii) Unirrigated. (viii) and (ix) N.A. (x) 22.12.61.

2. TREATMENTS :

4 previous crops : $T_1$=*Ragi*, $T_2$=*Sunhemp*, $T_3$=Green Gram and $T_4$=Horse Gram.
G.M. crop sown on 9.6.61 and ploughed in 17.7.61.

3. DESIGN ;

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 7·6 m.×20·1 m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Stunted growth. (ii) No. (iii) Grain yield, height and tiller counts. (iv) (a) 1961 only. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Expt. failed in 1962.

5. RESULTS :

(i) 775 Kg/ha. (ii) 100·8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 749 | 798 | 773 | 778 |

**Crop :- Ragi** (*Kharif*). **Ref :- Ms. 60(18), 61(70).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'C'.**

Object :—To find out suitable rotational crop in the cultivation of *Ragi* under rainfed conditions.

1. BASAL CONDITIONS :

(i) (a) As per treatments. (b) *Ragi*. (c) 9·9 C.L./ha. of Compost. (ii) Sandy loam. (iii) 7.7.60; 13.7.61. (iv) (a) Ploughings and harrowings. (b) Drilled. (c) 7 Kg/ha. (d) 23 cm. × 10 cm. in 60(18); 25 cm. between rows in 61(70). (e) N.A. (v) 100 Q/ha. of Compost+22 Kg/ha. of N+27 Kg/ha. of $P_2O_5$. (vi) H—22. (vii) Unirrigated. (viii) Intercultivation and weeding. (ix) 43 cm.; 72 cm. (x) 16.11.60 to 24.2.61; 29.11.61.

2. TREATMENTS :

6 previous crops : $T_1$=*Ragi*, $T_2$=Groundnut, $T_3$=Red gram, $T_4$=Dalichos lab-lab, $T_5$=Castor and $T_6$= Niger.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 11·0 m. × 5·9 m. ; 10·1 m. × 5·0 m. (b) 10.1 m. × 5·0 m. ; 9·6 m. × 4·6 m. (v) 46 cm. × 46 cm. ; 23 cm × 23 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960—61. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is present.

5. RESULTS :

(i) 1824 Kg/ha. (ii) 1097·5 Kg/ha. (based on 5 d.f. made up of Treatments × years interaction. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 2291 | 2105 | 1618 | 1520 | 1652 | 1759 |

| Years | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|
| 1960 | 1883 | 807 | 740 | 370 | 247 | 359 | ** | 734 | 95·0 |
| 1961 | 2699 | 3403 | 2495 | 2671 | 3058 | 3155 | ** | 2914 | 322·2 |
| Pooled | 2291 | 2105 | 1618 | 1520 | 1652 | 1759 | ** | 1824 | 1097·5 |

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**Crop :- Ragi** (*Kharif*). **Ref :- Ms. 61(68), 62(50).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'C'.**

Object :—To find out the advantages of transplanting over drilling of *Ragi*.

1. BASAL CONDITIONS :

(i) (a) *Ragi—Ragi*. (b) *Ragi*. (c) 7·4 C.L./ha. of Compost for 61(68), 75·3 Q/ha. of Compost+16·8 Kg/ha. of N+16·8 Kg/ha. of $P_2O_5$ in 62(50). (ii) Sandy soil. (iii) 17.7.61/16.8.61; 4.8.62/7.9.62. (iv) (a) 3 ploughings. (b) As per treatments. (c) 6 to 7 Kg/ha. (d) 30 cm. × 15 cm. (e) N.A. (v) 75·3 Q/ha. of Compost +16·8 Kg/ha. of $K_2O$. (vi) H—22. (vii) Unirrigated. (viii) 2 to 3 weedings and thinning. (ix) 72 cm.; 67 cm. (x) 4.12.61; 12.12.62.

2. TREATMENTS :

2 methods of sowing : $M_1$=Sowing through the drill and $M_2$=Transplanting.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 12·8 m.×4·6 m. (b) 12·5 m.×4·3 m. (v) 15 cm.×15 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) 1961–62. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is absent.

5. RESULTS :

(i) 1122 Kg/ha. (ii) 156·1 Kg/ha. (based on 11 d.f. made up of pooled error and Treatments×years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_1$ | $M_2$ |
|---|---|---|
| Av. yield | 832 | 1413 |

C.D.=140·3 Kg/ha.

| Years | $M_1$ | $M_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|
| 1961 | 1007 | 1701 | ** | 1354 | 138·0 |
| 1962 | 656 | 1125 | ** | 891 | 139·1 |
| Pooled | 832 | 1413 | ** | 1122 | 156·1 |

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**Crop :- Ragi (*Kharif*).** **Ref :- Ms. 62(45).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'C'.**

Object :—To study the advantages of drilling vs. broadcasting of *Ragi* under rainfed conditions.

1. BASAL CONDITIONS :

(i) (a) *Ragi—Ragi.* (b) *Ragi.* (c) 75·3 Q/ha. of Compost+16·8 Kg/ha. of N+16·8 Kg/ha. of $P_2O_5$ applied before sowing. (ii) Sandy soil. (iii) 4.8.62. (iv) (a) 3 ploughings (M.B. plough), 2 harrowing and passing brush harrows after sowing of seeds. (b) As per treatments. (c) 7 Kg/ha. (d) 30 cm. between rows (in case of drilling). (e) N.A. (v) 75·3 Q/ha. of Compost+16·8 Kg/ha. of N+16·8 Kg/ha. of $P_2O_5$. (vi) H—22. (vii) Unirrigated. (viii) Thinning of crops after 20 days of sowing and 2 weedings. (ix) 67 cm. (x) 12.12.62.

2. TREATMENTS :

2 methods of sowing : $M_1$=Broadcasting and $M_2$=Drilling.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) 12·8 m.×9·1 m. (iii) 6. (iv) (a) 12·8 m.×4·6 m. (b) 12·5 m.×4·3 m. (v) 15 cm.×15 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1962 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 656 Kg/ha. (ii) 90·7 Kg/ha. (iii) Treatment difference is not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $M_1$ | $M_2$ |
|---|---|---|
| Av. yield | 594 | 719 |

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**Crop :- Ragi (*Kharif*).** **Ref :- Ms. 62(51), 63(43).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'C'.**

Object :— To find out the optimum number of ploughing and harrowing as preparative cultivation for *Ragi*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Ragi* ; Groundnut. (c) N.A. (ii) Red sandy loam. (iii) 31.7.62 ; 16.7.63. (iv) (a) As per treatments. (b) Drilling. (c) 6 to 7 Kg/ha. (d) 30 cm.×15 cm. (e) N.A. (v) 100·4 Q/ha. of compost+22·4 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$. (vi) H-22 (late). (vii) Unirrigated. (viii) 2 hand weedings and gap filling. (ix) 65 cm. ; 58 cm. (x) 24.12.62 ; 5.12.63.

2. TREATMENTS :

6 numbers of ploughings and harrowings : $T_1$=2, $T_2$=3, $T_3$=4, $T_4$=5, $T_5$=6 and $T_6$=7.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) and (b) 5·0 m.×20·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tiller counts and yield of grain. (iv) (a) 1962—1963. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is present.

5. RESULTS :

(i) 1332 Kg/ha. (ii) 542·8 Kg/ha. (based an 5 d.f. made up of Treatments×years interaction. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 1311 | 1354 | 1190 | 1346 | 1442 | 1346 |

| Years | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|
| 1962 | 1315 | 1355 | 1353 | 1509 | 1797 | 1757 | ** | 1514 | 111·4 |
| 1963 | 1307 | 1352 | 1027 | 1183 | 1087 | 935 | N.S. | 1149 | 130·6 |
| Pooled | 1311 | 1354 | 1190 | 1346 | 1442 | 1346 | N.S. | 1332 | 542·8 |

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**Crop :- Ragi.** **Ref :- Ms. 60(19), 61(55).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'C'.**

Object :— To find the suitable sowing date for *Ragi*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Ragi*. (c) 9·9 C.L./ha. of F.Y.M. or compost. (ii) Sandy loam. (iii) As per treatments. (iv) (a) 4 ploughings. (b) Drilling. (c) 6 to 7 Kg/ha. (d) 30 cm.×15 cm. (e) N.A. (v) 9·9 C.L./ha. of compost for 60(19). 7·4 C.L./ha. of compost+22·4 Kg/ha. of N as A/S+13·4 Kg/ha. of $P_2O_5$ as Super for 61(55). (vi) H-22. (vii) Unirrigated. (viii) Intercultivation and weeding. (ix) 57 cm. ; 72 cm. (x) Nov. 1960 to Jan. 1961 ; N.A.

2. TREATMENTS :

4 dates of dowing : $D_1$=2nd fortnight of June, $D_2$=1st fortnight of July, $D_3$=2nd fortnight of July and $D_4$=1st fortnight of August.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 3 for 60(19) ; 4 for 61(55). (iv) (a) and (b) 11·0 m.×5·5 m. for 60(19) ; 29·3 m.×5·2 m. for 61(55). (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—1961 (1959 N.A.). (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is present.

5. RESULTS :

(i) 1203 Kg/ha. (ii) 461·0 Kg/ha. (based on 3 d. f. made up of Treatments×years interaction. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $D_1$ | $D_2$ | $D_3$ | $D_4$ |
|---|---|---|---|---|
| Av. yield | 1196 | 1325 | 1400 | 890 |

| Years | $D_1$ | $D_2$ | $D_3$ | $D_4$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|
| 1960 | 422 | 331 | 437 | 332 | N.S. | 380 | 62·6 |
| 1961 | 1777 | 2070 | 2122 | 1308 | ** | 1819 | 129·4 |
| Pooled | 1196 | 1325 | 1400 | 890 | N.S. | 1203 | 461·0 |

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**Crop :- Ragi (*Kharif*).** **Ref :- Ms. 60(21), 61(53).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'CMV'.**

Object :— To find out the merits of improved vs. local method of *Ragi* cultivation in dry lands.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Ragi*. (c) N.A. (ii) Red sandy loam. (iii) 27.6.60 ; 2.7.61. (iv) (a) 3 to 4 ploughings and 2 harrowings. (b) Seed drill. (c) 6 to 7 Kg/ha. (d) 30 cm.×15 cm. (e) N.A. (v) 9·9 C.L./ha. of compost broadcasted and covered by working country plough. (vi) H-22 (medium). (vii) Unirrigated. (viii) As per treatments. (ix) 43 cm. ; 72 cm. (x) 12.10.60 ; 28.11.61.

2. TREATMENTS :

2 methods of *Ragi* cultivation : $M_1$=Local method and $M_2$=Intensive method.

**Local Method :** (a) Local variety. (b) No seed treatment. (c) Thinning with *kunta*. (d) No fertiliser. (e) Intercultivation by *kunta* as locally done.

**Intensive Method :** (a) Improved variety H-22. (b) Seed treatment. (c) Thinning out to 15 cm. along the line and 30 cm. between lines. (d) Fertilisers at 62·8 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of N. (e) Intercultivation once in a week a minimum of 4 and 2 hand weeding. (f) Proper control of diseases in time.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 6 for 60(21) and 12 for 61(53). (iv) (a) 11·0 m.×5·9 m. (b) 10·1 m.× 5·0 m. (vi) 46 cm.×46 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tiller counts, height measurements and yield of grain. (iv) (a) 1959—1961 (failed in 1959). (b) Yes. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments×years interaction is present.

5. RESULTS :

(i) 2268 Kg/ha. (ii) 732·5 Kg/ha. (based on 1 d.f. made up of Treatments×years interaction). (iii) Treatment difference is not significant. (iv) Av. yield of grain Kg/ha.

| Treatment | $M_1$ | $M_2$ |
|---|---|---|
| Av. yield | 1908 | 2627 |

| | $M_1$ | $M_2$ | Sig. | G.M. | S.E./plot. |
|---|---|---|---|---|---|
| 1960 | 1973 | 2347 | ** | 2160 | 146·9 |
| 1961 | 1875 | 2767 | ** | 2321 | 277·9 |
| Pooled | 1908 | 2627 | N.S. | 2268 | 732·5 |

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**Crop :- Ragi (*Kharif* ).** **Ref :- Ms. 63(47).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'D'.**

Object :— To find out the most suitable chemical method of weed control in Ragi.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Ragi.* (c) 100·4 Q/ha. of compost+22·4 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (ii) Red sandy soil. (iii) 12.8.63. (iv) (a) N.A. (b) Dibbling. (c) 6 to 7 Kg/ha. (d) 30 cm.×15cm. (e) N.A. (v) 19·8 C.L./ha. of compost+33·6 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+11·2 Kg/ha. of $K_2O$. (vi) H-22. (vii) Unirrigated. (viii) Thinning, gap filling and weeding. (ix) 54 cm. (ix) 21.12.63.

2. TREATMENTS :

7 chemical treatments : $T_0$=Control (No spray), $T_1$=1·7 Kg. acid equivalent of 2, 4-D/ha as pre emergence spraying, $T_2$=1·7 Kg. acid equivalent of 2, 4-D/ha as post emergence spraying, $T_3$=1·7 Kg. acid equivalent of 2, 4-D/ha. as both pre and post emergence spraying. $T_4$=1·7 Kg. active ingredients of stem F-34/ha. as pre emergence spraying, $T_5$=1·7 Kg. active ingredients of stem F-34/ha. as post emergence spraying, $T_6$=1·7 Kg. active ingredients of stem F-34/ha. as post and pre emergence spraying.

. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 6·7 m.×5·5 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. Lodging in 2-4-D treated plots. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1963. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 803 Kg/ha. (ii) 580·3 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 994 | 382 | 784 | 698 | 842 | 1014 | 908 |

C.D.=862·2 Kg/ha.

**Crop :- Korra** (*Rabi*). **Ref :- Ms. 63(186), 64(152).**

**Site :- Soil Conservation Res. Stn., Bellary.** **Type :- 'M'.**

Object :—To evaluate the response to the application of spartin B, a synthetic mixture of micronutrients (for alkaline soils) under rainfed conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar—Korra.* (c) Nil ; As per treatments. (ii) Deep black cotton soils. (iii) 18.8.63; 18.6.64. (iv) (a) Light harrowing. (b) Sowing through the seed dibblers. (c) 3 Kg/ha. (d) 30 cm. × 15 cm. (e) 1. (v) As per treatments. (vi) *Hagari*—2 (medium). (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 18 cm.; 37 cm. (x) 22.11.63 ; 28.10.64.

2. TREATMENTS :

All combinations of (1) and (2)+2 extra treatments

(1) 2 levels of manures : $M_1$=5600 Kg/ha. of F.Y.M. and $M_2$=22·5 Kg/ha. of N as A/S+45 Kg/ha. of $P_2O_5$ as Super.

(2) 2 levels of Spartin B : $L_0$=0 and $L_1$=370 Kg/ha.

$T_0$=Control, $T_1$=5600 Kg/ha. of F.Y.M.+22·5 Kg/ha. of N as A/S+45 Kg/ha. of $P_2O_5$ as Super+370 Kg/ha. of Spartin B.

Spartin B is a synthetic mixture of micronutrients for alkaline soils.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) 21·9 m. × 11·0m. (iii) 4. (iv) (a) 7·3 m. × 5·5 m. (b) 6·7 m. × 4·9 m. (v) 30 cm. × 30 cm. (vi) Yes.

4, GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Height, tiller count etc. and yield of grain. (iv) (a) 1963—64. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent.

5. RESULTS :

**63(186)**

(i) 432 Kg/ha. (ii) 34·2 Kg/ha. (iii) M effect is highly significant. $T_0$ vs. $T_1$ is highly significant. (iv) Av. yield in Kg/ha.

$T_0$=227 Kg/ha., $T_1$=643 Kg/ha.

| | $M_1$ | $M_2$ | Mean |
|---|---|---|---|
| $L_0$ | 320 | 535 | 428 |
| $L_1$ | 301 | 563 | 432 |
| Mean | 310 | 549 | 430 |

C.D. for M marginal means=36·4 Kg/ha.

**64(152)**

(i) 537 Kg/ha. (ii) 72·7 Kg/ha. (iii) M effect is highly significant. $T_0$ vs. $T_1$ is highly significant. (iv) Av. yield of grain in Kg/ha.

$T_0$=294 Kg/ha., $T_1$=738 Kg/ha.

| | $M_1$ | $M_2$ | Mean |
|---|---|---|---|
| $L_0$ | 443 | 625 | 534 |
| $L_1$ | 508 | 612 | 560 |
| Mean | 476 | 618 | 547 |

C.D. for M marginal means=77·4 Kg/ha.

**Crop :- Korra.** **Ref :- Ms. 60(13).**

**Site :- Soil Conservation Res. Stn., Bellary.** **Type :- 'M'.**

Object :—To find out the optimum dose of N and P for *Korra*.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil, (ii) Black cotton soil. (iii) 26.9.60. (iv) (a) Harrowing. (b) Drilling. (c) 3 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) 80·7 Kg/ha. of A/S+161·4 Kg/ha. of Super. (vi) H—2. (vii) Unirrigated. (viii) Interculturing and stirring well. (ix) 31 cm. (x) 7.1.61.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 levels of N : $N_0$=0, $N_1$=22·4 and $N_2$=44·8 Kg/ha.
(2) 4 levels of $P_2O_5$ : $P_0$=0, $P_1$=22·4, $P_2$=44·8 and $P_3$=112·1 Kg/ha.

3. DESIGN :

(i) Fact in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/179 ha. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—60. (b) N.A. (c) Nil. (v) and (vi) Nil. (vii) The crop could not be sown in 59 due to non availability of rain.

5. RESULTS :

(i) 127 Kg/ha. (ii) 26·7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $P_3$ | Mean |
|---|---|---|---|---|---|
| $N_0$ | 141 | 156 | 130 | 73 | 125 |
| $N_1$ | 125 | 125 | 151 | 118 | 128 |
| $N_2$ | 127 | 117 | 129 | 137 | 128 |
| Mean | 131 | 133 | 140 | 107 | 127 |

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**Crop :- Korra.** **Ref :- Ms. 62(208).**

**Site :- Soil Conservation Res. Stn., Bellary.** **Type :- 'M'.**

Object :—To find out the optimum dose of N and P for economic return.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Deep black cotton soils. (iii) 1.9.62. (iv) (a) Light harrowing twice. (b) Sowing through seed drill. (c) 4 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) As per treatments. (vi) *Hagari*—2 (medium). (vii) Unirrigated. (viii) Hand weeding. (ix) 30 cm. (x) 12.12.62.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 levels of N : $N_0$=0, $N_1$=22·4 and $N_2$=44·8 Kg/ha.
(2) 4 levels of $P_2O_5$ : $P_0$=0, $P_1$=22·4, $P_2$=44·8 and $P_3$=112·0 Kg/ha.

3. DESIGN :

(i) Randomised scattard block design. (ii) (a) 12. (b) 38·4 m.×25·6 m. (iii) 3. (iv) (a) 38·4 m.×2·1 m. or 25·6 m.×3·2 m. (b) 55·6 sq. m. (v) 2 rows on each side. (vi) Yes.

4. GENERAL :

(i) Better and heathier growth of the crop was noticed in plots with N and P comination. (ii) Nil. (iii) Height, tiller count and yield (iv) (a) 1962 only. (b) No. (c) Nil. (v) to (vii) Nil

5. RESULTS :

(i) 420 Kg/ha. (ii) 44·2 Kg/ha. (iii) No effect is significant. (iv) Av. yield of grain in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $P_3$ | Mean |
|---|---|---|---|---|---|
| $N_0$ | 347 | 468 | 382 | 507 | 426 |
| $N_1$ | 269 | 439 | 498 | 537 | 436 |
| $N_2$ | 260 | 399 | 443 | 487 | 397 |
| Mean | 292 | 435 | 441 | 510 | 420 |

**Crop :- Korra.** **Ref :- Ms. 63(38), 64(27).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'M'.**

Object :—To find out the optimum dose of N,P, K to *Novane* crop to get the maximum yield under T.B.P.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Korra.* (b) Cotton. (c) 125·6 Q/ha. of F.Y.M.+44·8 Kg/ha. of N as A/S for 63(38), 125·6 Q/ha. of F.Y.M.+44·8 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ for 64(27). (ii) Black cotton soil. (iii) 20.6.63; 30.6.64. (iv) (a) 1 ploughing and 2 harrowings. (b) Dibbling. (c) 2 to 4 Kg/ha. (d) 30 cm. between rows. (e) 1. (v) 125·6 Q/ha. of F.Y.M. (vi) N—1 (medium). (vii) Irrigated. (viii) 2 hand weedings and working junior hoe once. (ix) 41 cm.; 58 cm. (x) 1.10.63; 22.10.64.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=33·6$ and $N_2=67·2$ Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_0=0$, $P_1=33·6$ and $P_2=67·2$ Kg/ha.
(3) 3 levels of $K_2O$ as Mur. Pot. : $K_0=0$ $K_1=33·6$ and $K_2=67·2$ Kg/ha.

Manures applied by hand in lines before sowing.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 1/165 ha.; 1/198 ha. (b) 1/247 ha. (v) 1 row on either side. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) No. of tillers, length of earhead and height of plants and yield of grain. (iv) (a) 1963—64. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent.

5. RESULTS :

**63(38)**

(i) 2111 Kg/ha. (ii) 298·1 Kg/ha. (iii) Main effects of N and P are significant. (iv) Av. yield of grain in Kg/ha.

|  | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 1550 | 1734 | 1501 | 1664 | 1562 | 1559 | 1595 |
| $N_1$ | 2125 | 2181 | 2136 | 2231 | 2249 | 1962 | 2147 |
| $N_2$ | 2226 | 2748 | 2795 | 2422 | 2721 | 2626 | 2590 |
| Mean | 1967 | 2221 | 2144 | 2106 | 2177 | 2049 | 2111 |
| $K_0$ | 1992 | 2103 | 2222 |  |  |  |  |
| $K_1$ | 1928 | 2474 | 2130 |  |  |  |  |
| $K_2$ | 1981 | 2086 | 2080 |  |  |  |  |

C.D. for N or P marginal means=205·8 Kg/ha.

64(27)

(i) 820 Kg/ha. (ii) 89·6 Kg/ha. (iii) Main effects of N, K and N×P interaction are significant. (iv) Av. yield of grain in Kg/ha.

|  | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 552 | 644 | 534 | 546 | 666 | 518 | 577 |
| $N_1$ | 882 | 763 | 817 | 762 | 864 | 836 | 821 |
| $N_2$ | 968 | 1116 | 1103 | 1036 | 1073 | 1078 | 1062 |
| Mean | 801 | 841 | 818 | 781 | 868 | 811 | 820 |
| $K_0$ | 740 | 790 | 814 |  |  |  |  |
| $K_1$ | 861 | 866 | 876 |  |  |  |  |
| $K_2$ | 808 | 867 | 764 |  |  |  |  |

C.D. for N or K marginal means=61·1 Kg/ha.
C.D. for body of N×P table =106·8 Kg/ha.

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**Crop :- Gram (*Rabi*).** **Ref :- Ms. 60(126).**

**Site :- Agri. Res. Stn., Bijapur.** **Type :- 'CV'.**

Object :— To find out most suitable spacing for different varieties of Gram.

1. BASAL CONDITIONS :

(i) (a) Wheat—Gram. (b) Wheat. (c) 9·9 C.L./ha. of F.Y.M. (ii) Deep black. (iii) 12.10.60. (iv) (a) Ploughing and harrowing. (b) Hand dibbling. (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Interculturing and hand weeding. (ix) 65 cm. (x) 28.2.61.

2. TREATMENTS :

**Main-plot treatments :**

3 spacing between lines : $S_1$=30 cm., $S_2$=37 cm. and $S_3$=46 cm.

**Sub-plot treatments :**

3 varieties : $V_1$=*Chafa*, $V_2$=Badaehana and $V_3$=N—1.

**Sub-sub-plot treatments :**

3 spacing between plants : $P_1$=6 cm., $P_2$=15 cm. and $P_3$=20 cm.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication, 3 sub-plots/main plot and 3 sub-sub plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) 7·3 m.×6·1 m. (b) 4·6 m.×1·8 m. (v) 2 border lines. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Pod borer attack, applied B.H.C. 10%. (iii) Yield of grain. (iv) (a) 1958—1960. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 931 Kg/ha. (ii) (a) 194·3 Kg/ha. (b) 229·9 Kg/ha. (c) 94·0 Kg/ha. (iii) V effect and interaction V×P is significant. P effect is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $V_1$ | $V_2$ | $V_3$ | $P_1$ | $P_2$ | $P_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $S_1$ | 1048 | 804 | 1097 | 1090 | 964 | 897 | 983 |
| $S_2$ | 754 | 882 | 998 | 974 | 857 | 803 | 878 |
| $S_3$ | 929 | 907 | 964 | 981 | 912 | 904 | 933 |
| Mean | 910 | 864 | 1020 | 1015 | 911 | 868 | 931 |
| $P_1$ | 1012 | 895 | 1139 | | | | |
| $P_2$ | 865 | 857 | 1013 | | | | |
| $P_3$ | 855 | 843 | 907 | | | | |

C.D. for V marginal means =113·8 Kg/ha.
C.D. for P marginal means =44·5 Kg/ha.
C.D. for P means at the same level of V=77·0 Kg/ha.
C.D. for V means at the same level of P=130·0 Kg/ha.

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**Crop :- Gram (*Rabi*).** **Ref :- Ms. 61(108).**
**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'IM'.**

Object :— To study the water and manurial requirements for Gram.

1. BASAL CONDITIONS :

(i) (a) Maize—Gram—Cotton. (b) Maize. (c) 12·4 C.L./ha. of F.Y.M. (ii) Black soil. (iii) 15.10.61. (iv) (a) Ploughing and harrowing with disc harrow. (b) to (e) N.A. (v) 12·4 C.L./ha. of F.Y.M. (vi) *Chafa* gram. (vii) Irrigated. (viii) 2 interculturings and 2 weedings. (ix) 5 cm. (x) 7.3.62 to 10.3.62.

2. TREATMENTS :

**Main-plot treatments :**
3 intervals of irrigation : $T_1$=20, $T_2$=25 and $T_3$=30 days.
**Sub-plot treatments :**
2 intensities of irrigation : $I_1$=6 and $I_2$=9 cm./turn.
**Sub-sub-plot treatments :**
2 levels of manures : $M_0$=0 and $M_1$=22·4 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$+11·2 Kg/ha. of $K_2O$.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication, 2 sub-plots/main-plot, 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) 7·3 m.×6·7 m. (b) 6·4 m.×6·1 m. (v) 40 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 1697 Kg/ha. (ii) (a) 565·6 Kg/ha. (b) 338·0 Kg/ha. (c) 302·2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of gram in Kg/ha.

| | $I_1$ | $I_2$ | $T_1$ | $T_2$ | $T_3$ | Mean |
|---|---|---|---|---|---|---|
| $M_0$ | 1627 | 1635 | 1657 | 1571 | 1658 | 1631 |
| $M_1$ | 1839 | 1688 | 1990 | 1585 | 1815 | 1763 |
| Mean | 1733 | 1661 | 1773 | 1581 | 1737 | 1697 |
| $T_1$ | 1982 | 1565 | | | | |
| $T_2$ | 1646 | 1516 | | | | |
| $T_3$ | 1571 | 1903 | | | | |

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**Crop :. Gram (*Rabi*).** **Ref :- Ms. 62(110).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'IM'.**

Object :— To study the water and manurial requirements of Gram.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Maize. (c) F.Y.M. at 103·8 C.L./ha. Super at 454·7 Kg/ha. Mur. Pot. at 66·7 Kg/ha., Urea at 192·7 Kg/ha. (ii) Black mixed sandy loam. (iii) 13.11 62. (iv) (a) Ploughing and harrowing. (b) to (e) N.A. (v) 24·7 C.L./ha. of F.Y.M. (vi) *Chafa* gram. (vii) Irrigated. (viii) One interculturing. 2 weedings. (ix) 22·4 cm. (x) 7.3.63.

2. TREATMENTS :

**Main-plot treatments :**
3 No. of irrigations : $T_1=4$ (20 days interval), $T_2=3$ (25 days interval) and $T_3=3$ (30 days interval).

**Sub-plot treatments :**

All combination of (1) and (2).

(1) 2 intensities of irrigation : $I_1=5$ cm. and $I_2=9$ cm.

(2) 2 levels of manures : $M_0=0$ and $M_1=22·4$ Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$+11·2 Kg/ha. of $K_2O$.

3. DESIGN :

(i) Split-plot. (ii) 3 main-plots/replication, 4 sub-plots/main-plot. (iii) 3. (iv) (a) 7·3 m.×6·7 m. (b) 6·4 m.×6·1 m. (v) and (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1103 Kg/ha. (ii) (a) 189·6 Kg/ha. (b) 246·6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $I_1$ | $I_2$ | $M_0$ | $M_1$ | Mean |
|---|---|---|---|---|---|
| $T_1$ | 1288 | 1140 | 1123 | 1305 | 1214 |
| $T_2$ | 1003 | 947 | 1007 | 942 | 975 |
| $T_3$ | 1151 | 1087 | 963 | 1275 | 1119 |
| Mean | 1147 | 1058 | 1031 | 1174 | 1103 |
| $M_0$ | 1064 | 998 | | | |
| $M_1$ | 1230 | 1118 | | | |

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**Crop :- Gram (*Rabi*).** **Ref :- Ms. 60(278).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'IM'.**

Object : — To find out the optimum water and manurial requirement of Gram.

1. BASAL CONDITIONS:

(i) (b) Maize—Gram. (b) Maize. (c) 12·4 C.L./ha. of F.Y.M.+33·6 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$+ 11·2 Kg/ha. of $K_2O$. (ii) Black soil. (iii) 24.10.60. (iv) (a) Ploughing, harrowing and opening furrows (b) Dibbling. (c) N.A. (d) 30 cm. × 23 cm. (e) 2 to 3. (v) 12·4 C.L./ha. of F.Y.M. (vi) *Chafa* (122 days duration). (vii) Irrigated. (viii) Weeding and interculturing. (ix) 8 cm. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 5 fertilizers : $M_0$=No fertilizer, $M_1$=22·4 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super, $M_2=M_1$+22·4 Kg/ha. of Pot. Sul., $M_3$=44·8 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super and $M_4=M_3$+22·4 Kg/ha. of $K_2O$ as Pot. Sul.

(2) 2 irrigation levels : I=6·4 and $I_2$=8·9 ha. cm.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 7·3m. × 6·7m. (b) 6·4 m. × 6·1 m. (v) and (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) and (vi) Nil. (vii) In general the season was favourable for crop growth.

5. RESULTS :

(i) 2030 Kg/ha. (ii) 360·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

| | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|---|
| $I_1$ | 2385 | 1948 | 1871 | 2042 | 1888 | 2027 |
| $I_2$ | 2291 | 2198 | 1855 | 2017 | 1804 | 2033 |
| Mean | 2338 | 2073 | 1863 | 2030 | 1846 | 2030 |

**Crop :- Green Gram (*Kharif*).** **Ref :- Ms. 62(207).**

**Site :- Soil Conservation Res. Stn., Bellary.** **Type :- 'C'.**

Object :—To find out the optimum seed rate for Green Gram.

1. BASAL CONDITIONS ;

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Deep black cotton soils. (iii) 9.6.62. (iv) (a) Light harrowing. (b) Sowing through seed drill. (c) As per treatments. (d) 30 cm. between rows. (e) - . (v) Nil. (vi) China mung No. 781 (early). (vii) Unirrigated. (viii) Hand weeding. (ix) 17 cm. (x) 8 to 21.8.1962.

2. TREATMENTS :

5 seed rates : $R_1=4$, $R_2=5$, $R_3=9$, $R_4=11$ and $R_5=13$ Kg/ha.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 18·3 m.×11·0 m. (iii) 6. (iv) (a) and (b) 11·0 m.×3 7 m. (v) Nil (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil (iii) Canopy measurement, population count and grain yield. (iv) (a) 1961—1962. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Expt. failed in 1961.

5. RESULTS :

(i) 53·6 Kg/ha. (ii) 23·7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $R_1$ | $R_2$ | $R_3$ | $R_4$ | $R_5$ |
|---|---|---|---|---|---|
| Av. yield | 44·0 | 53·5 | 55·1 | 52·1 | 63·1 |

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**Crop :- Tur (*Kharif*).** **Ref :- Ms. 64(25), 65(92).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'D'.**

Object :—To find out a suitable insecticide that can control the Tur pod borer.

1. BASAL CONDITIONS :

(i) (a) *Jowar—Tur—Jowar*. (b) Cowpea : *Rabi Jowar*. (c) 125·5 Q/ha. of F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (ii) Black Cotton soil. (iii) 27.6.1964 ; 23.6.1965. (iv) (a) Working victory plough, working with blade harrow and ridger in 1964 ; ploughing and harrowing in 1965. (b) Hand dibbling. (c) 6 to 8 Kg/ha. (d) N.A. (e) 2 to 3 seeds dibbled, thinned to one. (v) 125·5 Q/ha. of F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ applied at the time of sowing. (vi) Early ; medium (Udgir). (vii) Irrigated. (viii) 2 hand weedings passing blade harrow in between rows twice in 1964 ; thinning and weeding in 1965. (ix) 59 cm. ; 32 cm. (x) N.A. ; 10.1.1966.

2. TREATMENTS :

4 spraying treatments : $T_0$=Control, $T_1$=Servin 85 % S.P. 0·5 %, $T_2$=B.H.C. 50 % –0·5% and $T_3$=D.D.T. 50%–0·5%.

Treatments applied at the time of bud formation.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 1/247 ha. (b) 1/494 ha. (v) 5 rows. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Tur pod longer—control measures as per treatments. (iii) Pest counts were taken after 12 days of spraying. (iv) (a) 1964—contd. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) The percentage of pods were transferred into angles and analysed, the transformation being $\theta=\sin^{-1}\sqrt{p}$ where p is the percentage.

5. RESULTS :

**64(25)**

(i) 9·46 % of 400 pods. (ii) 0·1 %. (iii) Treatment differences are highly significant. (iv) Av. percentage of pests count in degrees.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av. percentage | 14·9 | 6·3 | 8·1 | 8·6 |

**65(92)**

(i) 17·62 degrees, (ii) 1·85 degrees. (iii) Treatment differences are highly significant. (iv) Av. percentage of pest count in degrees.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av. degree | 22·69 | 12·78 | 14·13 | 20·88 |
| Av. percentage | 14·9 | 4·9 | 6·0 | 12·7 |

C.D.=2·53 degrees.

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**Crop :- Potato (*Kharif*).** **Ref :- Ms. 63, 64, 65(S.F.T).**

**Site :- (District) Bangalore.** **Type :- 'M'.**

Object :—Type $A_1$ : To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red loamy. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :
$N_1$=60 Kg/ha. of N.
$N_2$=120 Kg/ha. of N.
$P_1$=35 Kg/ha. of $P_2O_5$.
$N_1P_1$=60 Kg/ha. of N+35 Kg/ha. of $P_2O_5$.
$N_2P_1$=120 Kg/ha. of N+35 Kg/ha. of $P_2O_5$.
$N_2P_2$=120 Kg/ha. of N+70 Kg/ha. of $P_2O_5$.
$N_2P_2K_1$=120 Kg/ha. of N+70 Kg/ha. of $P_2O_5$+35 Kg/ha. of $P_2O_5$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

A selected district is divided into four agriculturally homogeneous zones based on climate, soil, cropping pattern etc. In each zone one block is selected at random. A block normally consists of a group of 50—100 villages. In each block 36 experiments are conducted in a year of which 11 are of type $A_1$, 11 of type $A_2$, 11 of type $A_3$ and 3 are of type C. The eleven experiments under type $A_1$, $A_2$ and $A_3$ are distributed as 3 on a *kharif* cereal, 3 on a *rabi* cereal, 3 on a cash crop and 2 on oil seed. All the three type-C experiments are conducted on a legume crop. For the purpose of conducting the $A_1$, $A_2$ and $A_3$ experiments 11 villages are randomly selected in each block and in each village 3 experiments one each of type $A_1$, $A_2$ and $A_3$ are laid out. For conducting the three type-C trials three villages are randomly selected in each block.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1063—65. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

63(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of potato in Kg/ha. | 629 | 461 | 214 | 1113 | 1271 | 1429 | 2016 | 368·4 |

Control yield=7012 Kg/ha ; No. of trials=5.

64 (S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of potato in Kg/ha. | 247 | 568 | 523 | 673 | 848 | 993 | 1135 | 113·1 |

Control yield=3281 Kg/ha ; No. of trials=5.

65(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of potato in Kg/ha. | 224 | 196 | 348 | 684 | 972 | 1068 | 816 | 225·9 |

Control yield=10472 Kg/ha ; No. of trials=5.

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**Crop :- Potato** (*Rabi*). **Ref :- Ms. 62 (S.F.T.).**

**Site :- (District) : Banglore.** **Type :- 'M'.**

Object :—Type $A_1$ : To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red loamy. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS : and 3. DESIGN :

Same as in Type $A_1$ (*Kharif*) on page 288.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962 to 1966 [1963 to 1965 N.A.] (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of potato in Kg/ha. | 1977 | 3275 | 1318 | 3855 | 4316 | 5944 | 7228 | 2048·6 |

Control yield=35039 Kg/ha. ; No. of trials=3.

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**Crop :- Potato** (*Kharif*). **Ref :- Ms. 63, 64, 65 (S.F.T.)**

**Site :- (District) : Banglore.** **Type :- 'M'.**

Object :—Type $A_2$ : To study the response curves of important cereal, cash and oilseed crops to phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red loamy. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments.

O =Control (no manure).
$N_1$ =60 Kg/ha. of N.
$P_1$ =35 Kg/ha. of $P_0O_5$.
$P_2$ =70 Kg/ha. of $P_2O_5$.
$N_1P_1$ =60 Kg/ha. of N+35 Kg/ha. of $P_2O_5$.
$N_1P_2$ =60 Kg/ha. of N+70 Kg/ha. of $P_2O_5$.
$N_2P_2$ =120 Kg/ha. of N+70 Kg/ha. of $P_2O_5$.
$N_2P_2K_2$ =120 Kg/ha. of N+70 Kg/ha. of $P_2O_5$+70 Kg/ha. of $K_2O$.

N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in Type $A_1$ (*Kharif*) on page 288.

4. GENERAL :

(i) to (iii) N A. (iv) (a) 1963 to 1965. (b) N.A. (c) Nil. (v) to (vii) N A.

5. RESULTS :

63(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of potato in Kg/ha. | 1087 | 685 | 1014 | 1759 | 1324 | 1858 | 2517 | 295·1 |

Control yield=6714 Kg/ha. ; No of trials=6.

64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of potato in Kg/ha. | 322 | 425 | 596 | 754 | 838 | 1161 | 1367 | 129·4 |

Control yield=3288 Kg/ha. ; No. of trials=5.

65(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of potato in Kg/ha. | 1328 | —96 | 368 | 572 | 668 | 1068 | 1052 | 690·6 |

Control yield=9792 Kg/ha. ; No. of trials=5.

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**Crop :- Potato** (*Rabi*). **Ref :- Ms. 62 (S.F.T.)**
**Site :- (District) : Banglore.** **Type :- 'M'.**

Object :—Type $A_2$ : To study the response curves of important cereal, cash and oilseed crops to phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (iii) Red loamy. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATEMENTS : and 3. DESIGN :

Same as in Type $A_2$ (*Kharif* )on page 289.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962 to 1966 [1963 to 1965 N.A.]. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of potato in Kg/ha. | 619 | 613 | 652 | 922 | 1344 | 1996 | 2570 | 289·5 |

Control yield=7413 Kg/ha. ; No. of trials=3.

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**Crop :- Potato (*Kharif*).** **Ref :- Ms. 63, 64, 65 (S.F.T.)**

**Site :- (District) : Banglore,** **Type :- 'M'.**

Object :—Type $A_3$ : To study the response curves of important cereal, cash and oilseed crops to potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Alluvial (iii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :

O =Control (no manure).
$N_1$ =60 Kg/ha. of N.
$K_1$ =60 Kg/ha. of $K_2O$.
$K_2$ =120 Kg/ha. of $K_2O$.
$N_1K_1$ =60 Kg/ha. of N+60 Kg/ha. of $K_2O$.
$N_1K_2$ =60 Kg/ha. of N+120 Kg/ha. of $K_2O$.
$N_2K_2$ =120 Kg/ha. of N+120 Kg/ha. of $K_2O$.
$N_1P_1K_1$ =60 Kg/ha. of N+35 Kg/ha. of $P_2O_5$+60 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in Type $A_1$ (*Kharif*) on page 288.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1963 to 1965. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of potato in Kg/ha. | 395 | 168 | 622 | 968 | 919 | 1403 | 1067 | 216·2 |

Control yield=7739 Kg/ha.; No. of trials=2.

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of potato in Kg/ha. | 403 | 191 | 377 | 619 | 795 | 889 | 1052 | 89·7 |

Control yield=3325 Kg/ha. ; No. of trials=5.

65(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of potato in Kg/ha. | 190 | 315 | 410 | 640 | 750 | 1125 | 1125 | 192·7 |

Control yield=9675 Kg/ha. ; No. of trials=4.

**Crop :- Potato** (*Rabi*). **Ref :- Ms. 62 (S.F.T.).**

**Site :- (District) : Banglore.** **Type :- 'M'.**

Object :—Type $A_3$ : To study the response curves of important cereal, cash and oilseed crops to potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red loamy. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in Type $A_3$ (*Kharif*) on page 291.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962 to 1966 [1963 to 1965 N.A.]. (b) N.A. (c) Nil. (v) to (vii) N A.

5. RESULTS :

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of potato in Kg/ha. | 448 | 297 | 520 | 916 | 1034 | 1265 | 1357 | 216·2 |

Control yield=7848 Kg/ha. ; No. of trials=3.

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**Crop :- Sugarcane.** **Ref :- Ms. 60(292).**

**Site :- Agri. Res. Stn., Alnawar.** **Type :- 'M'.**

Object :—To find out a suitable ratio of A/S and Cake for manuring the plant Cane.

1. BASAL CONDITIONS :

(i) (a) Paddy—Sugarcane—Ratoon. (b) Paddy. (c) Nil. (ii) Medium black. (iii) 31.1.60. (iv) (a) Ploughing, clod crushing, levelling, opening ridges and furrows. (b) Planting of setts. (c) 24,700 setts/ha. (d) 91 cm. between lines. (e) N.A. (v) Nil. (vi) Co-419. (vii) Irrigated. (viii) Loosening the soil by hand tools interculturing. (ix) 89 cm. (x) 28.1.61.

2. TREATMENTS : and 3. DESIGN :

Same as in expt. No. 60(291) on page 292.

F.Y.M. was applied in furrows, Super applied at 8 to 13 cm. deep in furrows. N was given in 3 doses, at the time of planting, 8 weeks after planting and at earthing up.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Cane yield. (iv) (a) 1956—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 399·5 Q/ha. (ii) 69·2 Q/ha. (iii) Treatment differences are significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 333·2 | 277·5 | 364·7 | 352·7 | 337·8 | 377·7 | 272·9 | 442·7 | 307·2 | 473·3 |

C.D.=118·7 Q/ha.

**Crop :- Sugarcane (*Ratoon*).** **Ref :- Ms. 60(291).**

**Site :- Agri. Res. Stn., Alnawar.** **Type :- 'M'.**

Object :—To find out a suitable ratio of A/S and G.N.C. for manuring *Ratoon* cane crop.

1. BASAL CONDITIONS :

(i) (a) Plant cane—*Ratoon*—Paddy. (b) Cane. (c) As per *ratoon* crop treatments. (ii) Medium black. (iii) *Ratoon* crop. (iv) (a) Ploughing between lines with the iron plough cutting stubbles to the ground level. (c) 24,700 setts/ha. (d) 91 cm. (e) 1. (v) Nil. (vi) Co—419. (vii) Irrigated. (viii) Weeding once. (ix) 89 cm. (x) 31.1.61.

2. TREATMENTS :

10 manurial treatments : $T_1$=168 Kg/ha. of N as A/S, $T_2$=168 Kg/ha, of N as A/S and G.N.C. in 2·1 ratio, $T_3$=168 Kg/ha. of N as A/S and G.N.C. in 1 : 1 ratio, $T_4=T_1$+24·7 C.L./ha. of F.Y.M., $T_5=T_2$+24·7 C.L./ha. of F.Y.M., $T_6=T_3$+24·7 C.L./ha. of F.Y.M., $T_7=T_1$+37·1 C.L./ha. of F.Y.M., $T_8=T_4$+112 Kg/ha. of $P_2O_5$, $T_9$= 37·1 C.L./ha. of F.Y.M.+33·6 Kg/ha. of N as A/S and $T_{10}=T_9$+112 Kg/ha. of $P_2O_5$,

All the $P_2O_5$ as Super was given before ploughing on the sides. N was given in 3 doses as at the time of opening the ridges, after 8 weeks and at the time of earthing up.

3. DESIGN .

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 11·6 m.×5·5 m. (b) 9·1 m.×3·7 m. (v) 122 cm. ring alround. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Cane yield. (iv) (a) 1956– N.A. (b) Yes. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 337 4 Q/ha. (ii) 90·1 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 273·8 | 330·4 | 310·9 | 275·6 | 347·1 | 270·1 | 379·6 | 362·0 | 426·0 | 398·1 |

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**Crop :- Sugarcane.** **Ref :- Ms. 60(289).**

**Site :- Agri. Res. Stn., Alnawar.** **Type :- 'M'.**

Object :—To find out the effect of different levels of P with different levels of N on Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Paddy—Sugarcane. (b) Paddy. (c) Nil. (ii) Medium black. (iii) 25.1.60. (iv) (a) Ploughing, clod crushing, opening ridges and furrows. (b) Planting setts. (c) 24,700 setts/ha. (d) 91 cm. between lines. (e) Nil. (v) 24·7 C.L./ha. of F.Y.M. (vi) Co—419. (vii) Irrigated. (viii) Loosing soil by hand tool, height earthing up and weeding. (ix) 89 cm. (x) N.A.

2. TREATMENTS :

6 fertilizers : $T_1$=168 Kg/ha. of N+112 Kg/ha. of $P_2O_5$ as Super, $T_2$=168 Kg/ha. of N+168 Kg/ha. of $P_2O_5$ as Super, $T_3$=224 Kg/ha. of N+112 Kg/ha. of $P_2O_5$ as Super, $T_4$=224 Kg/ha. of N+168 Kg/ha. of $P_2O_5$ as Super, $T_5$=168 Kg/ha. of N+112 Kg/ha. of $P_2O_5$ as B.M. and $T_6=T_5$+5 Q/ha. of lime.

N was given in the form of A/S and G.N.C. in 1 : 1 in 3 doses, one at the time of planting, second after 8 weeks of planting and third at the time of earthing up. ½ dose of $P_2O_5$ was given at the time of planting and the other ½ at the time of earthing up.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 11·6 m.×5·5 m. (b) 9·1 m.×3·7 m. (v) and (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Cane yield. (iv) (a) 1956—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 499·5 Q/ha. (ii) 63·9 Q/ha. (iii) Treatment differences are significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 490·7 | 459·4 | 497·7 | 588·9 | 405·1 | 555·5 |

C.D.=96·3 Q/ha.

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**Crop :- Sugarcane.** **Ref :- Ms. 60(281).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'M'.**

Object :—To determine the effect of N, P and K on Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Maize—Sugarcane. (b) Maize. (c) 33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+12·4 C.L./ha. of F.Y.M. (ii) Brown sandy loam. (iii) 6.1.60. (iv) (a) Ploughing, clod crushing, 2 harrowing, opening furrows. (b) Planting of setts. (c) 29640 3 eyebuded setts/ha. (d) 108 cm. between lines. (e) 1. (v) 37 C.L./ha. of F.Y.M.+spreading and mixing by ploughing. (vi) Co—419. (vii) Irrigated. (viii) Interculturing and weeding. (ix) 73 cm. (x) 13, 14.2.1961.

2. TREATMENTS :

All combinations of (1) and (2) with 224 Kg/ha. of N as A/S and G.N.C. in 1 : 2 ratio.

(1) 2 levels of $P_2O_5$ as Super at planting : $P_0=0$ and $P_1=84$ Kg/ha.

(2) 2 levels of $K_2O$ as Mur. Pot. at planting : $K_0=0$ and $K_1=84$ Kg/ha.

N applied in 4 doses first at planting, second at 8 weeks after, third at 16 weeks after and fourth at earthing up.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 10·4 m.×4·3 m. (b) 8·5 m.×2·1 m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Cane yield. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS ;

(i) 1248·5 Q/ha. (ii) 104·6 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of Cane in Q/ha.

| | $K_0$ | $K_1$ | Mean |
|---|---|---|---|
| $P_0$ | 1253·1 | 1295·2 | 1274·1 |
| $P_1$ | 1240·8 | 1204·8 | 1222·9 |
| Mean | 1246·9 | 1250·1 | 1248·5 |

**Crop :- Sugercane.** **Ref :- Ms. 61(103), 62(135), 63(233).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'M'.**

Object :— To ascertain whether Nitro. Phos. and Mg. Phos. can be used for supplying P to Sugarcane instead of Super.

1. BASAL CONDITIONS :

(i) (a) *Jowar*/Maize, Sunnhemp, Sugarcane. (b) *Jowar*/Maize, Sunnhemp. (c) G.M. (ii) Black mixed alkaline ; Sandy loam. (iii) 24.1.1961 ; 14.1.1962 ; 21.1.1963. (iv) (a) Ploughing and harrowing, clod crushing opening furrows. (b) Planted in furrows. (c) N.A. (d) N.A. in 1963, 1964 and 91 cm. between rows. (e) N.A. (v) 37·1 C.L./ha. of F.Y.M. in 1961, 22·2 C.L./ha. of F.Y.M. in 1962 and 19·8 C.L./ha. of F.Y.M. in '63. (vi) Co—419. (vii) Irrigated. (viii) 1 interculturing, 3 weedings and earthing up operation. (ix) 52 cm, ; 58 cm. ; 58 cm. (x) 11 to 14.2.1962 ; 28.1.1963 ; Feb. 1964.

2. TREATMENTS :

4 manurial treatments : $T_1$=224·2 Kg/ha. of N as A/S+84·1 Kg/ha. of $P_2O_5$ as Super, $T_2$=224·2 Kg/ha. of N as A/S+84·1 Kg/ha. of $P_2O_5$ as Mg. phos., $T_3$=140·1 Kg/ha. of N as A/S+84·1 Kg/ha. of N as Nitro. Phos.+84·1 Kg/ha. of $P_2O_5$ as Nitro. phos. (O.D.D.A.) and $T_4$=130·0 Kg/ha. of N as A/S+94·2 Kg/ha. of N as Nitro. phos. +84·1 Kg/ha. of $P_2O_5$ as Nitro. phos. (P.E.C.)

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 10·1 m.×11·0 m. (b) 8·2 m.×9·1 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Stem-borer controlled by mechanical measure and spraying with folidol (iii) Yield of cane. (iv) (a) 1961—'63. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homgeneous. Treatments×years interaction is absent.

5. RESULTS :

(i) 1033·6 Q/ha. (ii) 62·6 Q/ha. (based on 51 d.f. made up of pooled error and treatments×years interaction.) (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 1021·5 | 1033·2 | 1050·0 | 1032·9 |

| Years | $T_1$ | $T_2$ | $T_3$ | $T_4$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|
| 1961 | 889·0 | 886·8 | 889·9 | 876·6 | N.S. | 885·6 | 71·6 |
| 1962 | 1134·5 | 1114·7 | 1133·8 | 1169·2 | N.S. | 1138·0 | 52·9 |
| 1963 | 1040·9 | 1089·2 | 1126·2 | 1052·9 | N.S. | 1077·3 | 58·7 |
| Pooled | 1021·5 | 1030·2 | 1050·0 | 1032·9 | N.S. | 1033·6 | 62·6 |

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**Crop :- Sugarcane.** **Ref :- Ms. 62(40).**

**Site :- Sugarcane Res. Stn., Gangavathy.** **Type :- 'M'.**

Object :— To study the possibilities of replacing organic manures by inorganic fertilisers.

1. BASAL CONDITIONS :

(i) (a) Paddy—Sugarcane. (b) *Paddy*. (c) 24·7 C.L./ha. of F.Y.M.+44·8 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$. (ii) Mixed soil. (iii) 30.1.62. (iv) (a) 3 ploughing with country plough. (b) Planted in furrows. (c) 24710 setts/ha. (v) Nil. (vi) Co—419 (late). (vii) Irrigated. (viii) and (ix) N.A. (x) Feb 1963.

2. TREATMENTS :

4 manurial treatments : $T_1$=252·2 Kg/ha. of N as A/S+56·0 Kg/ha. of $P_2O_5$+112·1 Kg/ha. of $K_2O$+49·4 C.L./ha. of compost, $T_2$=252·2 Kg/ha. of N as A/S/N+56·0 Kg/ha. of $P_2O_5$ +112·1 Kg/ha. of $K_2O$+49·4 C.L./ha. of compost, $T_3$=24·7 C.L./ha. of compost equivalent in the form of artificial fertilisers+252·2 Kg/ha. of N as A/S+56·0 Kg/ha. of $P_2O_5$+112·1 Kg/ha. of $K_2O$ and $T_4$=12·4 C.L./ha. of compost+37·1 C.L./ha. of compost equivalent in the form of artificial fertilirers + 252·2 Kg/ha. of N+56·0 Kg/ha. of $P_2O_5$+112·1 Kg/ha. of $K_2O$.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 21·9 m.×18·3 m. (iii) 6. (iv) (a) and (b) 11·0 m.×9·1 m. (v) Nil. (vi) Yes.

4. GENERAL ;

(i) Satisfactory. (ii) Nil. (iii) Cane yield. (iv) (a) 1962. (b) No. (c) Nil. (v) (a) Shankeswar and Shimoga. (b) Nil. (vi) Nil. (vii) Expt. conducted at Nagenhally village.

5. RESULTS :

(i) 827·6 Q/ha. (ii) 14·3 Q/ha. (iii) Treatment differences are significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 815·2 | 825·9 | 826·9 | 842·5 |

C.D.=17·6 Q/ha.

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**Crop :- Sugarcane.** **Ref :- Ms. 62(39).**

**Site :- Sugarcane Res. Stn., Gangavathy.** **Type :- 'M'.**

Object :— To study the possibilities of replacing organic manures by inorganic fertilisers.

1. BASAL CONDITIONS :

(i) (a) Paddy – Sugarcane. (b) Paddy. (c) 24·7 C.L./ha. of F.Y.M.+44·8 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$. (ii) Black cotton soil. (iii) 10.1.1962. (iv) (a) Deep ploughing by tractor followed by ridging. (b) Transplanting. (c) 24710 setts/ha. (d) 91 cm. between rows. (e) N.A. (v) Nil. (vi) Co.—419 (late). (vii) Irrigated. . (viii) and (ix) N.A. (x) Feb, 1963.

2. TREATMENTS to 4. GENERAL :

Same as in Expt. No. 62(40) on 295.

Expt. conducted at Kotlala village.

5. RESULTS :

(i) 1074·7 Q/ha. (ii) 62·5 Q/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 1044·5 | 988·5 | 1137·6 | 1128·3 |

C.D.=76·9 Q/ha.

**Crop :- Sugarcane.** **Ref :- Ms. 62(38).**

**Site :- Sugarcane Res. Stn., Gangavathy.** **Type :- 'M'.**

Object : – To study the possibilities of replacing oil cakes and compost by fertilisers in Sugarcane manuring.

1. BASAL CONDITIONS :

(i) (a) Paddy—Sugarcane. (b) Paddy. (c) 24·7 C.L./ha. of F.Y.M.+44·8 Kg/ha. of N+33·6 Kg/ha of $P_2O_5$. (ii) Black cotton soil. (iii) 22.2.62. (iv) (a) Deep ploughing by tractor followed by ridging. (b) Planting in furrows. (c) 24710 setts/ha. (d) 91 cm. between rows. (e) N.A. (v) Nil. (vii) Co. 419. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) Feb. and March, 68.

2. TREATMENTS to 4. GENERAL :

Same as in Expt. No. 62(40) on page 295. (Expt. conducted at I.S.A. Farm, Munirabad).

5. RESULTS :

(i) 1300·6 Q/ha, (ii) 30·8 Q/ha. (iii) Treatment differences are not significant, (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 1288·2 | 1274·9 | 1319·5 | 1319 9 |

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**Crop :- Sugarcane.** **Ref :- Ms. 62(41).**

**Site :- Sugarcane Res. Stn., Gangavathy.** **Type :- 'M'.**

Object :—To study the effect of P on the yield and quality of Cane.

1. BASAL CONDITIONS :

(i) (a) Paddy – Sugarcane. (b) Paddy. (c) 24·7 C.L./ha. of F.Y.M.+44·8 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$. (ii) Black soil. (iii) 22.2.62. (iv) (a) 3 ploughings. (b) Planting in furrows. (c) 24710 setts/ha. (d) 91 cm. between rows. (e) Nil. (v) Nil. (vi) Co—419 (late). (vii) Irrigated. (viii) and (ix) N.A. (x) Feb. to March, 63.

2. TREATMENTS :

4 manurial treatments : $T_1$=24·7 C.L./ha. of compost+252·2 Kg/ha. of N as A/S, $T_2$=56·0 Kg/ha. of $P_2O_5$ at planting+24·7 C.L./ha. of compost+112·1 Kg/ha. of $K_2O$+252·2 Kg/ha. of N, $T_3$=56·0 Kg/ha. of $P_2O_5$ at planting+56·0 Kg/ha. of $P_2O_5$ at earthing up +24·7 C.L./ha. of compost+112·1 Kg/ha. of $K_2O$+252·2 Kg/ha. of N and $T_4$= 112·1 Kg/ha. of $P_2O_5$ at planting+24·7 C.L./ha. of compost+112·1 Kg/ha. of $K_2O$+252·2 Kg/ha. of N.

N applied as A/S and $P_2O_5$ as Super.

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) 21·9 m.× 18·3 m. (iii) 6. (iv) (a) and (b) 11·0 m.×9·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Weight of Cane in metric Tons/plot. (iv) (a) 1962—N.A. (b) No. (c) Nil. (v) Shankeswar and Shimoga. (vi) Nil. (vii) Expt. conducted at I.S.A. Farm, Munirabad.

5. RESULTS:

(i) 1239·9 Q/ha. (ii) 37·5 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 1227·2 | 1227·6 | 1225·4 | 1279·0 |

**Crop :- Sugarcane (*Main*).** **Ref :- Ms. 63(24).**

**Site :- Sugarcane Res. Stn., Gangavathy.** **Type :- 'M'.**

Object :—To explore the possibilities of replacing organic manures wholly or partly for main season Cane.

### 1. BASAL CONDITIONS :

(i) (a) *Daincha*—Sugarcane. (b) *Daincha*. (c) Nil. (ii) Black cotton soil. (iii) January, 1963. (iv) (a) Deep ploughing with tractor followed by discing. (b) Planted in furrows. (c) Nil. (d) 91 cm. between rows. (e) N.A. (v) Nil. (vi) Co—419 (late). (vii) Irrigated. (viii) 3 hand weedings followed by heavy ridging. (ix) N.A. (x) 13.2.64 to 18.2.64.

### 2. TREATMENTS:

10 manurial treatments : $M_0$=Control (no manure), $M_1$=20 C.L./ha. of F.Y.M., $M_2$=N, P and K equivalent of $M_1$ in inorganic form, $M_3=M_1+M_7$, $M_4=M_2+M_7$, $M_5$=10 C.L./ha. of F.Y.M.+$M_7$+N, P and K equivalent of ½ of $M_2$ in organic form, $M_6=M_7+$5 C.L./ha. of F.Y.M.+N, P and K equivalent of 3/4 of $M_2$ in inorganic form, $M_7$=336 Kg/ha. of N+84 Kg/ha. of $P_2O_5$+112 Kg/ha. of $K_2O$ as top dressing, $M_8=M_7$ with N as A/S and G.N.C. in 1 : 1 ratio and $M_9=M_1+M_8$.

### . DESIGN

(i) R.B.D. (ii) (a) 10. (b) 36·6 m.×29·9 m. (iii) 4. (iv) (a) 14·0 m.×7·3 m. (b) 12·2 m.×5·5 m. (v) one border row is kept on either side. (vi) Yes.

### 4. GENERAL :

(i) Fair. Crop lodged slightly in the month of November 1964. (ii) Nil. (iii) Tiller counts, height measurements, cane samples for sucrose were analysed. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) Mandya. (b) Nil. (vi) and (vii) Nil.

### 5. RESULTS :

(i) 1134·5 Q/ha. (ii) 115·6 Q/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of Sugarcane in Q/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 316·9 | 574·4 | 1136·9 | 1347·7 | 1265·9 | 1360·1 | 1399·7 | 1298·7 | 1369 8 | 1274·8 |

C.D.=167·7 Q/ha.

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**Crop :- Sugarcane (*Main*).** **Ref :- Ms. 63(27).**

**Site :- Sugarcane Res. Stn., Gangavathy.** **Type :- 'M'.**

Object :—To study the relative efficiency and the effect of different nitrogeneous fertilizers on the yield and quality of Cane.

### 1. BASAL CONDITIONS :

(i) (a) *Daincha*—Sugarcane. (b) *Daincha*. (c) Nil. (ii) Black cotton soil. (iii) Jan. 1973. (iv) (a) Deep ploughing with tractor followed by discing. (b) Planted in furrows. (c) 24710 setts/ha. (d) 91 cm. between furrows. (e) N.A. (v) 24·7 C.L./ha. of F.Y.M.+84·1 Kg/ha. of $P_2O_5$+112·1 Kg/ha. of $K_2O$. (vi) Co—419. (vii) Irrigated. (viii) 2 hand weedings followed by heavy ridging. (ix) N.A. (x) 15 to 20.1.1964.

### 2. TREATMENTS :

6 sources of 336·2 Kg/ha. of N : $S_1$=Urea, $S_2$=A/S, $S_3$=C/N, $S_4$=A/C, $S_5$=A/S/N and $S_6$=C/A/N.
Nitrogeneous fertilizers applied 10, 20, 30 and 40% at planting, 6, 10, and 14 weeks after planting respectively.

3. DESIGN:

(i) L. Sq. (ii) (a) 6. (b) 49·4 m.×11·0 m. (iii) 6. (iv) (a) 11·0 m.×8·2 m. (b) 9·1 m.×6·4 m. (v) 91.cm. ×91 cm. (vi) Yes.

4. GENERAL:

(i) Fair. (ii) Slight incidence of mealy was observed and controlled by sprayiag malathion. (iii) Tiller counts, height measurements and yield of Cane. (iv) (a) 1963 only. (b) No. (c) Nil. (v) *Mandya.* (vi) and (vii) Nil.

5. RESULTS:

(i) 1005·3 Q/ha. (ii) 179·9 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 1075·6 | 899·0 | 992·6 | 977·5 | 1056·4 | 1030·7 |

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**Crop :- Sugarcane.** **Ref :- Ms. 63(25), 64(21).**

**Site :- Sugarcane Res. Stn., Gangavathy.** **Type :- 'M'.**

Object :—To find out optimum combinations of N, P and K for Cane.

1. BASAL CONDITIONS:

(i) (a) *Jowar*—Sugarcane. (b) Fallow ; *Jowar.* (c) Nil; 22·4 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$+12·4 C.L./ha. of F.Y.M. (ii) Black cotton soil. (iii) 2.2.63; 8.2.64. (iv) (a) Deep ploughing with tractor followed by discing. (b) Planted in furrows. (c) 29653 setts/ha.; 24710 setts/ha. (d) 91 cm. between rows. (e) Nil. (v) 24·7 C.L./ha. of F.Y.M. (vi) Co—419 (late). (vii) Irrigated. (viii) Nil; 3 hand weedings. (ix) N.A. (x) 18 to 20.2.64; 6.3.65.

2. TREATMENTS:

All combinations of (1), (2) and (3)

(1) 2 levels of N as A/S : $N_1$=224·2 and $N_2$=336·2 Kg/ha.

(2) 2 levels of $P_2O_5$ as Super : $P_0$=0 and $P_1$=168·1 Kg/ha.

(3) 2 levels of $K_2O$ as Mur. Pot. : $K_0$=0 and $K_1$=112·1 Kg/ha.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 8. (b) 24·4 m.×25·6 m. (iii) 4. (iv) (a) 12·2 m.×6·4 m. (b) 10·4 m.×4·6 m. (v) 91 cm.×91 cm (vi) Yes.

4. GENERAL:

(i) Fair in 1963. Population not uniform due to *alkali* attack in 1964. (ii) Smutted clumps were removed as and when they appeared (1963). Nil in 1964. (iii) Tiller counts, height measurements and cane yield. (iv) (a) 1963 to 64. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous. Treatments×years interaction is present.

5. RESULTS:

(i) 665·3 Q/ha. (ii) 259·4 Q/ha. (based on 6 d.f. made up of Treatments×years interaction). (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

| | $K_0$ | $K_1$ | $N_1$ | $N_2$ | Mean |
|---|---|---|---|---|---|
| $P_0$ | 673·1 | 581·9 | 625·2 | 629·8 | 627·5 |
| $P_1$ | 768·5 | 637·8 | 685·5 | 720·8 | 703·1 |
| Mean | 720·8 | 609·8 | 655·4 | 675·3 | 665·3 |
| $N_1$ | 682·5 | 628·3 | | | |
| $N_2$ | 759·1 | 591·4 | | | |

| Years | $N_1$ | $N_2$ | Sig. | $P_0$ | $P_1$ | Sig. | $K_0$ | $K_1$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1963 | 802·4 | 772·1 | N.S. | 743·6 | 830·9 | N.S. | 912·0 | 662·5 | ** | 787·3 | 207·1 |
| 1964 | 508·3 | 578·3 | N.S. | 511·4 | 575·4 | N.S. | 529·6 | 557·2 | N.S. | 543·4 | 181·9 |
| Pooled | 655·4 | 675·3 | N.S. | 627·5 | 703·1 | N.S. | 720·8 | 609·8 | N.S. | 665·3 | 259·4 |

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**Crop :- Sugarcane.** **Ref :- Ms. 62(217), 64(160), 65(51).**

**Site :- Agri. Res. Stn., Hiriyur.** **Type :- 'M'.**

Object :—To study the effect of N, P and K on Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) 67 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$ and $K_2O$ each. (ii) Black soil. (iii) 15 8.62; 13.7.64; 20.9.65. (iv) (a) 1 to 3 ploughings in 1962 and 64; 3 ploughings, 1 harrowing and levelling twice in 65. (b) Planting setts. (c) 29640 setts/ha. (d) N.A. in 62, 64 and 91 cm. between rows in 65. (e) N.A. (v) 24·7 C.L./ha. of F.Y.M. in 62 and 64, 12·4 to 14·8 C.L./ha. of F.Y.M. in 65. (vi) Co—419. (vii) Irrigated. (viii) 3 to 4 interculturings and earthing up. (ix) 262 cm.; 75 cm.; 81 cm. (x) 18.11.63; 23.10.65; 12.12.66.

2. TREATMENTS :

All combinations of (1), (2) and (3).

(1) 3 levels of N : $N_1$=280, $N_2$=392 and $N_3$=504 Kg/ha.
(2) 3 levels of $P_2O_5$ : $P_0$=0, $P_1$=84 and $P_2$=168 Kg/ha.
(3) 3 levels of $K_2O$ : $K_0$=0, $K_1$=112 and $K_2$=224 Kg/ha.

10, 20, 30 and 40 percent of N applied at planting, 6th week, 10th week and 14th week after planting respectively.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 9·1 m.×9·1 m. (b) 9·1 m. ×7·3 m. in 62 and 64; 8·2 m.×8·2 m. in 65. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Cane yield. (iv) (a) 1962 to 67. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Data and Results for the year 1963 N.A.

5. RESULTS :

**62(217)**

(i) 1096·5 Q/ha. (ii) 209·4 Q/ha. (iii) Interaction N×P×K alone is significant. (iv) Av. yield of Cane in Q/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 1094·9 | 1121·3 | 1204·5 | 1148·1 | 1299·5 | 973·1 | 1140·2 |
| $N_2$ | 1030·8 | 1130·0 | 941·4 | 996·6 | 995·7 | 1109·9 | 1034·1 |
| $N_3$ | 1197·2 | 1147·4 | 1001·4 | 1081·1 | 1162·2 | 1102·5 | 1115·3 |
| Mean | 1107·6 | 1132·9 | 1049·1 | 1075·3 | 1152·5 | 1061·8 | 1096·5 |
| $K_0$ | 1114·7 | 1089·9 | 1021·4 | | | | |
| $K_1$ | 1247·1 | 1264·6 | 945·8 | | | | |
| $K_2$ | 961·1 | 1044·2 | 1180·2 | | | | |

**64(160)**

(i) 1117·5 Q/ha. (ii) 332·8 Q/ha. (iii) Interaction N×P×K alone is significant (iv) Av. yield of Cane in Q/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 1126·2 | 1115·5 | 962·3 | 1054·0 | 1079·4 | 1070·7 | 1068·0 |
| $N_2$ | 1043·3 | 1118·0 | 1257·8 | 997·7 | 1203·9 | 1217·4 | 1139·7 |
| $N_3$ | 1111·3 | 983·7 | 1339·2 | 966·0 | 1501·9 | 966·3 | 1144·7 |
| Mean | 1093·6 | 1072·4 | 1186·4 | 1005·9 | 1261·7 | 1084·8 | 1117·5 |
| $K_0$ | 1017·4 | 913·0 | 1087·4 | | | | |
| $K_1$ | 1158·6 | 1230·4 | 1396·2 | | | | |
| $K_2$ | 1104·8 | 1073·9 | 1075·7 | | | | |

**65(51)**

(i) 922·8 Q/ha. (ii) 260·8 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of Cane in Q/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 933·1 | 993·1 | 784·9 | 912·9 | 954·7 | 843·5 | 903·7 |
| $N_3$ | 858·0 | 624·1 | 1014·5 | 880·4 | 804·5 | 811·8 | 832·2 |
| $N_5$ | 993·4 | 1066·9 | 1037·2 | 1011·6 | 1024·4 | 1061·5 | 1032·5 |
| Mean | 928·2 | 894·7 | 945·5 | 935·0 | 927·9 | 905·6 | 922·8 |
| $K_0$ | 935·5 | 977·9 | 891·5 | | | | |
| $K_1$ | 904·5 | 918·2 | 960.9 | | | | |
| $K_2$ | 944·4 | 788·1 | 984·3 | | | | |

**Crop :- Sugarcane.** **Ref :- Ms. 62(218), 64(161).**

**Site :- Agri. Res. Stn., Hiriyur.** **Type :- 'M'.**

Object :—To determine suitable quantity and time of application of phosphatic fertilizers to Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Paddy—*Ragi*—Groundnut. (b) Paddy. (c) 67·2 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$. (ii) Red soil. (iii) 20.8.62; 17.6.64. (iv) (a) 3 to 4 ploughings, opening furrows 91 cm. apart. (b) Planting. (c) 24700 to 29640 setts/ha. (d) 91 cm. between rows. (e) 1. (v) 336 Kg/ha. of N+84 Kg/ha. of $P_2O_5$+112 Kg/ha. of $K_2O$. (vi) Co—419. (vii) Irrigated. (viii) 2 interculturings and earthing up. (ix) 25 cm.; 75 cm. (x) 10.11.63; 6.10.65.

2. TREATMENTS :

5 applications of phosphatic fertilizers : $P_0$=Control, $P_1$=84 Kg/ha. of $P_2O_5$ at 10 cm. depth, $P_2$=84 Kg/ha. of $P_2O_5$ at 10 cm. depth with compost (1 : 8), $P_3$=No $P_2O_5$ to G.M. crop at sowing, $P_4$=84 Kg/ha. of $P_2O_5$ to G.M, crop at sowing and $P_5$=84 Kg/ha. of $P_2O_5$ to Cane at planting+84 Kg/ha. of $P_2O_5$ to G.M. crop at sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×9·1 m. (b) 9·1 m.×8·2 m. (v) and (vi) Yes.

4. GENERAL :

(i) Fair, (ii) N.A. (iii) Yield of Cane (iv) (a) 1962 to 66 (treatments modified in 65). (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Data for the year 1963 N.A. Error variances are homogeneous. Treatments×years interaction is absent.

5. RESULTS .

(i) 811·6 Q/ha. (ii) 180·1 Q/ha. (based on 35 d.f. made up of pooled error and Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of Cane in Q/ha.

| Treatment | $P_0$ | $P_1$ | $P_2$ | $P_3$ | $P_4$ | $P_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 769.2 | 814·0 | 742·4 | 843·4 | 859·8 | 840·8 |

| | $P_0$ | $P_1$ | $P_2$ | $P_3$ | $P_4$ | $P_5$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|
| 1962 | 799·8 | 873·0 | 837·4 | 977·9 | 934·3 | 1020·8 | N.S. | 907·2 | 153·0 |
| 1964 | 738·6 | 754·9 | 647·3 | 709·0 | 785·4 | 660·9 | N.S. | 716·0 | 210·9 |
| Pooled | 769·2 | 814·0 | 742·4 | 843·4 | 859·8 | 840·8 | N.S. | 811·6 | 180 1 |

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**Crop :- Sugarcane.** **Ref :- Ms. 65(48).**

**Site :- Agri. Res. Stn., Hiriyur.** **Type :- 'M'.**

Object :—To determine suitable quantity and time of application of phosphatic fertilizers to Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—Paddy—Paddy. (b) Paddy. (c) 67·2 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$ and $K_2O$ each. (ii) Red loam. (iii) 18.7.65. (iv) (a) 3 ploughings, passing cultivator once and harrowing once. (b) Planting setts. (c) 29640 setts/ha. (d) 91 cm. between rows. (e) Nil. (v) 24·7 C.L./ha. of F.Y.M. (vi) Co—419. (vii) Irrigated. (viii) Earthing up once; passing of wooden plough once. (ix) 90 cm. (x) 30.8.66.

2. TREATMENTS :

8 phosphatic treatments : $T_1$=112 Kg/ha. of $P_2O_5$ at planting, $T_2$=112 Kg/ha. of $P_2O_5$ with compost at planting, $T_3$=56 Kg/ha. of $P_2O_5$ at planting+56 Kg/ha. of $P_2O_5$ at earthing up, $T_4$=56 Kg/ha. of $P_2O_5$ at planting+56 Kg/ha. of $P_2O_5$ at earthing up with compost, $T_5$=168 Kg/ha. of $P_2O_5$ at planting, $T_6$=168 Kg/ha of $P_2O_5$ at planting with compost, $T_7$=84 Kg/ha. of $P_2O_5$ at planting+84 Kg/ha. of $P_2O_5$ at earthing up, $T_8$=84 Kg/ha. of $P_2O_5$ at planting+84 Kg/ha. of $P_2O_5$ at earthing up with compost.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) 36·6 m.×18·3 m. (iii) 3. (iv) (a) 9·1 m.×9·1 m. (b) 8·2 m.×8·2 m. (v) 1 row on either side. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Stem borer attack, sprayed Endrin. (iii) Cane yield. (iv) (a) 1964 to 66 (experiment modified in 65). (b) No. (c) Nil. (v) Mandya and Hebbal. (vi) and (vii) Nil.

5. RESULTS :

(i) 601·2 Q/ha. (ii) 59·8 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of Cane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 580·7 | 599 4 | 572·3 | 645·2 | 536·4 | 675·7 | 587·6 | 612·2 |

**Crop :- Sugarcane.** **Ref :- Ms. 60(173), 61(170).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To find out the effect of split application of phosphate on Sugarcane.

1. BASAL CONDITIONS:

(i) (a) *Ragi*—Sugarcane. (b) *Ragi*. (c) Nil. (ii) Sandy loam. (iii) 13.6.60; 15.7.61. (iv) (a) Ploughing, clod crushing. (b) Planting setts. (c) 30000, 3 eye budded setts/ha. (d) 91 cm. between rows. (e) 1. (v) 112 Q/ha. of F.Y.M. and 336 Kg/ha. of N in 4 doses. (vi) CO—419. (vii) Irrigated. (viii) Interculturing and weeding. (ix) 117 cm.; 176 cm. (x) 19.7.61; 11.11.62.

2. TREATMENTS :

4 methods of application of 84 Kg/ha. of $P_2O_5$ : $M_1$=At planting on the surface, $M_2$=10 cm. below the surface, $M_3$=Half at planting+half at earthing up and $M_4$= At earthing up.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×7·3 m. (b) 7·3 m.×5·5 m.; 9·1 m.×7·3 m. (v) 91 cm.× 91 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Tiller counts, cane population and yield of sugarcane. (iv) (a) 1959—61. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances for the years 1959 to 61 are heterogeneous and interaction is absent.

5. RESULTS :

**60(173)**

(i) 1890 Q/ha. (ii) 276 7 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ |
|---|---|---|---|---|
| Av. yield | 1906 | 1912 | 1736 | 2006 |

**61(170)**

(i) 716 Q/ha. (ii) 71·6 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of Sugarcane in Q/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ |
|---|---|---|---|---|
| Av. yield | 698 | 695 | 712 | 760 |

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**Crop :- Sugarcane.** **Ref :- Ms. 60(203), 61(208).**

**Site :- Reg. Res. Stn., Mandya.** **Type :- 'M'.**

Object :— To study the effect of application of N on the yield and quality of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Ragi* — Sugarcane. (b) *Ragi*. (c) N.A. (ii) Sandy loam. (iii) 14.6.1960 ; 8.9.1961. (iv) (a) Ploughing. (b) Planting. (c) 29600 setts/ha. (d) 91 cm. between rows. (e) 1. (v) 24 C.L./ha. of compost +84 Kg/ha. of $P_2O_5$. (vi) CO—419. (vii) Irrigated. (viii) 3 harrowings. (ix) 60 cm. ; N.A. (x) 18.7.1961 ; N.A.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 2 sources of 336 Kg/ha. of N : $S_1$=A/S and $S_2$=Urea.

(2) 3 methods of application of N : $M_1$=In 4 doses 10, 20, 30 and 40% at planting, 6, 10 and 14 weeks after planting, $M_2$=In 5 doses 5, 10, 15, 30 and 40% at planting, 6, 10, 14 and 18 weeks after planting and $M_3$=In 6 doses 5, 10, 15 20, 25 and 30% at planting, 6, 9, 12, 14 and 18 weeks after planting respectively.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 7·1 m.×9·1 m. (b) 5·5 m.×7·1 m. (v) 82 cm. ×100 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of Sugarcane. (iv) (a) 1960 to 1961. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous. Treatments×years interaction is absent.

5. RESULTS :

(i) 1532 Q/ha. (ii) 197·7 Q/ha. [based on 35 d.f. made up of pooled and Treatments×years interaction]. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

| | $M_1$ | $M_2$ | $M_3$ | Mean |
|---|---|---|---|---|
| $S_1$ | 1459 | 1679 | 1506 | 1548 |
| $S_2$ | 1488 | 1547 | 1570 | 1515 |
| Mean | 1474 | 1613 | 1508 | 1532 |

| Years | $M_1$ | $M_2$ | $M_3$ | Sig. | $S_1$ | $S_2$ | Sig. | G.M. | S.E./Plot |
|---|---|---|---|---|---|---|---|---|---|
| 1960 | 1637 | 1825 | 1679 | N.S. | 1704 | 1722 | N.S. | 1713 | 194·2 |
| 1961 | 1310 | 1400 | 1337 | N.S. | 1391 | 1308 | N.S. | 1349 | 220·5 |
| Pooled | 1474 | 1613 | 1508 | N.S. | 1548 | 1515 | N.S. | 1532 | 197·7 |

**Crop :- Sugarcane (*Adsali*).** **Ref :- Ms. 60(190), 61(193), 62(173).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To study the effect of phosphatic fertilizer through *Sannhemp* on the yield.

### 1. BASAL CNNDITIONS :

(i) (a) and (b) Nil. (c) N.A. (ii) Sandy loam. (iii) 5.10.1960 ; 9.6.1961 ; 17.9.1962. (iv) (a) Ploughing, clod crushing and levelling. (b) Planting setts. (c) 29,640 setts/ha. with 3 eyebud. (d) 91 cm. between rows. (e) 1. (v) 336 Kg/ha. of N in 4 rows. (vi) CO. 419 (late). (vii) Irrigated. (viii) Hand weeding, intercultivation and earthing up. (ix) Normal. (x) 15.10.1961 ; 17.9.1962 and 28.10.1963.

### 2. TREATMENTS :

6 manurial treatments : $T_1$= 25 C.L./ha. of F.Y.M.+112/Kg/ha. of $P_2O_5$ as Super at planting, $T_2$= 25 C.L./ha. of F.Y.M.+224 Kg/ha. of $P_2O_5$ as Super at planting, $T_3$=*Sannhemp* at 5604 Kg/ha.+112 Kg/ha. of $P_2O_5$ as Super at planting, $T_4$=*Sannhemp* at 5604 Kg/ha.+224 Kg/ha. of $P_2O_5$ as Super at planting, $T_5$=*Sannhemp* at 112 Kg/ha. of $P_2O_5$ as Super to *sannhemp* and $T_6$=*Sannhemp* at 5604 Kg/ha.+224 Kg/ha. of $P_2O_5$ as Super to *sannhemp.*

### 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 7·3 m.×7·3 m. ; 9·1 m.×9·1 m. (v) N.A. (vi) Yes.

### 4. GENERAL :

(i) Fair. (ii) 2—4, D was sprayed. (iii) Germination, tiller count and yield of cane. (iv) (a) 1960 to 1962. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous. Treatments×years interaction is absent.

### 5. RESULTS :

**60(190)**

(i) 1662 Q/ha. (ii) 177·8 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 1654 | 1687 | 1665 | 1790 | 1690 | 1488 |

**61(193)**

(i) 1587 Q/ha. (ii) 264·9 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 1565 | 1521 | 1443 | 1677 | 1525 | 1792 |

**62(173)**

(i) 1796 Q/ha. (ii) 129·6 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 1788 | 1962 | 1835 | 1840 | 1679 | 1671 |

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**Crop :- Sugarcane.** **Ref :- Ms. 60(205), 61(211), 62(204).**
**Site :- Reg. Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To study the effect of important green manures crops on the succeeding major crop of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) Nil. (ii) Sandy loam. (iii) 29.11.1959 ; 12.7.1961 ; 30.9.1961. (iv) (a) Ploughing. (b) Planting. (c) 29, 652 (3-budded) setts/ha. (d) 91 cm. between rows. (e) N.A. (v) 84 Kg/ha. of $P_2O_5$+336 Kg/ha. of N in 3 doses+112 Kg/ha. of $K_2O$, 28 C.L./ha. of F.Y.M. applied to control plots. (vi) CO—419. (vii) Irrigated. (viii) Passing tin harrow and blade harrow 3 times ; weeding and culturing. (ix) 60 cm. ; 110 cm. ; 127 cm. (x) 28 12.1960 ; 26.10.1962 ; 9.11.1963.

2. TREATMENTS :

4 previous G.M. crops : $T_0$=Control (No G.M. crop), $T_1$=*Sannhemp*, $T_2$=*Dhaincha* and $T_3$=*Sasbania Speciosa.*

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 8·2 m.×12·2 m. (b) 6·4 m.×10·4 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Cane yield. (iv) (a) 1960 to 1962. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent.

5. RESULTS :

**60(205)**

(i) 796 Q/ha. (ii) 33·4 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av. yield | 797 | 805 | 796 | 785 |

**61(211)**

(i) 1616 Q/ha. (ii) 146·4 Q/ha. (iii) Treatment differences are significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av. yield | 1797 | 1478 | 1624 | 1565 |

C.D.=180·1 Q/ha.

**62(204)**

(i) 1204 Q/ha. (ii) 176·7 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av. yield | 1230 | 1203 | 1190 | 1192 |

**Crop :- Sugarcane.** **Ref :- Ms. 61(171), 62(210).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To study the effect of lime on the yield of Cane.

1. BASAL CONDITIONS :

(i) (a) Nii. (b) *Ragi*. (c) 33·6 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+67·2 Kg/ha. of $K_2O$. (ii) Sandy loam. (iii) 10.10.1961 ; 12.10.1962. (iv) (a) Ploughing. (b) Planting setts. (c) 30,000 setts/ha. with 3 eye buds/sett. (d) 91 cm. between rows. (e) 1. (v) 112 Q/ha. of F.Y.M.+84 Kg/ha. of $P_2O_5$+112 Kg/ha. of $K_2O$ +336 Kg/ha. of N in 4 doses. (vi) CO—419. (vii) Irrigated. (viii) Hand weeding and interculturing. (ix) 165 cm. ; N A. (x) 11.1.1963 ; 15 1.1964.

2. TREATMENTS :

6 doses of lime : $L_0$=0, $L_1$=6·3, $L_2$=12·6, $L_3$=18·8, $L_4$=25·1 and $L_5$=37·7 Q/ha.
Lime applied on 23.7.1961 and 3rd week after planting, ploughed into the soil and cultivation was done.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×9·1 m. (b) 9·1 m.×7·3 m. (v) 91 cm. on either side. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1961 to 1963 (Treatments changed in 1963). (b) No. (c) Nil. (v) and (vi) No. (vii) Error variances are heterogeneous and Treatments×years interaction is absent.

5. RESULTS :

61(171)

(i) 1238 Q/ha. (ii) 337·6 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $L_0$ | $L_1$ | $L_2$ | $L_3$ | $L_4$ | $L_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1179 | 1230 | 1236 | 1209 | 1289 | 1283 |

62(210)

(i) 1548 Q/ha. (ii) 132·7 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $L_0$ | $L_1$ | $L_2$ | $L_3$ | $L_4$ | $L_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1474 | 1538 | 1546 | 1512 | 1613 | 1604 |

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**Crop :- Sugarcane.** **Ref :- Ms. 63(154).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'M'.**

Object : —To study the effect of lime on the yield of Cane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Ragi*. (c) 33·6 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+67·2 Kg/ha. of $K_2O$. (ii) Sandy loam. (iii) 13.9.63. (iv) (a) Ploughing. (b) Planting in setts. (c) 3 eyebudded, 30,000 setts/ha. (d) 91 cm. between rows. (e) N.A. (v) 112 Q/ha. of F.Y.M.+84 Kg/ha. of $P_2O_5$+112 Kg/ha. of $K_2O$+336 Kg/ha. of N in 4 doses. (vi) Co—419. (vii) Irrigated. (viii) Hand weeding and interculturing. (ix) 187 cm. (x) 29.11.64.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 levels of lime : $L_0$=0, $L_1$=12·6 Q/ha. of lime and $L_2$=37·7 Q/ha. of Dolomite.
(2) 2 levels of *Sannhemp* : $S_0$=Control and $S_1$=*Sannhemp* (quantity N.A.).

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×6·1 m. (b) 7·3 m.×6·1 m. (v) 91 cm. on either side. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of cane. (iv) (a) 1961—63 (modified in 63). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1052 Q/ha. (ii) 179·2 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

| | $L_0$ | $L_1$ | $L_2$ | Mean |
|---|---|---|---|---|
| $S_0$ | 1079 | 982 | 1031 | 1031 |
| $S_1$ | 1144 | 1019 | 1053 | 1072 |
| Mean | 1112 | 1000 | 1042 | 1052 |

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**Crop :- Sugarcane (*Adsali*).** **Ref :- Ms. 62(172), 63(168), 64(128), 65(40).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To find the optimum combination of N, P and K for *Adsali* Cane.

1. BASAL CONDITIONS :

(i) (a) and (b) Nil. (c) N.A. (ii) Sandy loam. (iii) 14.8.62; 29.9.63; 8.7.64 ; 7.7.65. (iv) (a) Ploughing, clod crushing and levelling. (b) Planting setts. (c) 29,640 setts/ha. (3-eye budded). (d) 91 cm. between rows. (e) 1. (v) 25 C.L./ha. of F.Y.M. at planting. (vi) Co.—419 (late). (vii) Irrigated. (viii) 2 to 3 hand weedings and interculturing by bullocks and earthing up. (ix) Normal in 62 to 64; 116 cm. in 65. (x) 16.11.63; 15.12.64; 27.10.65 ; 26 to 28.11.66.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 levels of N as A/S : $N_1=224$ and $N_2=336$ Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_1=56$, $P_2=112$ and $P_3=168$ Kg/ha.
(3) 3 levels of $K_2O$ as Pot. Chl. : $K_1=84$, $K_2=168$ and $K_3=252$ Kg/ha.

10, 20, 30 and 40% of N applied at planting, 6, 10, 14 weeks after planting respectively. $P_2O_5$ applied at planting.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 3 for 62 and 2 for other years. (iv) (a) 11·9 m.×11·9 m. (b) 10·1 m.×10·1 m. (v) 91 cm.×91 cm. (vi) Yes.

4- GENERAL :

(i) Fair. (ii) 2—4, D weedicides sprayed 2 to 3 days after planting. (iii) Sugarcane yield. (iv) (a) 1962—65. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent.

5. RESULTS :

**62(172)**

(i) 1744·2 Q/ha. (ii) 351·7 Q/ha. (iii) Interaction N×P is significant. (iv) Av. yield of sugarcane in Q/ha.

|  | $P_1$ | $P_2$ | $P_3$ | $K_1$ | $K_2$ | $K_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 1666·3 | 1777·6 | 1584·8 | 1641·9 | 1707·2 | 1679·6 | 1676·2 |
| $N_2$ | 1803·5 | 1591·2 | 2041·8 | 1812·9 | 1758·4 | 1865·2 | 1812·2 |
| Mean | 1734·9 | 1684·4 | 1813·3 | 1727·4 | 1732·8 | 1772·4 | 1744·2 |
| $K_1$ | 1618·3 | 1647·0 | 1916·9 |  |  |  |  |
| $K_2$ | 1807·0 | 1558·7 | 1832·6 |  |  |  |  |
| $K_3$ | 1779·4 | 1847·4 | 1690·5 |  |  |  |  |

C.D. for body of NP table=337·0 Q/ha.

**63(168)**

(i) 1414·2 Q/ha. (ii) 136·4 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

|  | $P_1$ | $P_2$ | $P_3$ | $K_1$ | $K_2$ | $K_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 1364·3 | 1471·1 | 1489·5 | 1461·7 | 1437·7 | 1425·5 | 1441·6 |
| $N_2$ | 1363·7 | 1341·1 | 1455·3 | 1323·7 | 1492·3 | 1344·1 | 1386·7 |
| Mean | 1364·0 | 1406·1 | 1472·4 | 1392·7 | 1465·0 | 1384·8 | 1414·2 |
| $K_1$ | 1282·1 | 1363·3 | 1532·7 |  |  |  |  |
| $K_2$ | 1511·7 | 1454·7 | 1428·6 |  |  |  |  |
| $K_3$ | 1298·1 | 1400·3 | 1455·9 |  |  |  |  |

**64(128)**

(i) 1866·4 Q/ha. (ii) 171·9 Q/ha. (iii) Main effect of N is significant. K effect is highly significant. (iv) Av. yield of sugarcane in Q/ha.

|  | $P_1$ | $P_2$ | $P_3$ | $K_1$ | $K_2$ | $K_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 1763·4 | 1807·8 | 1793·3 | 1606·6 | 1843·5 | 1914·4 | 1788-2 |
| $N_2$ | 1970·4 | 1977·2 | 1886·1 | 1869·2 | 1850·1 | 2114·5 | 1944·6 |
| Mean | 1866·9 | 1892·5 | 1839·7 | 1737·9 | 1846·8 | 2014·4 | 1866·4 |
| $K_1$ | 1689·1 | 1683·4 | 1841·2 |  |  |  |  |
| $K_2$ | 1885·1 | 1916·2 | 1739·0 |  |  |  |  |
| $K_3$ | 2026·5 | 2077·9 | 1938·9 |  |  |  |  |

C.D. for N marginal means=120·9 Q/ha.

C.D. for K marginal means=148·1 Q/ha.

**65(40)**

(i) 1603·4 Q/ha. (ii) 283·6 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

|  | $P_1$ | $P_2$ | $P_3$ | $K_1$ | $K_2$ | $K_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 1553·9 | 1789·2 | 1606·6 | 1576·9 | 1722·3 | 1650·5 | 1649·9 |
| $N_2$ | 1475·1 | 1537·0 | 1658·8 | 1576·3 | 1491·3 | 1603·4 | 1557·0 |
| Mean | 1514·5 | 1663·1 | 1632·7 | 1576·6 | 1606·8 | 1626·9 | 1603·4 |
| $K_1$ | 1584·3 | 1573·5 | 1572·0 |  |  |  |  |
| $K_2$ | 1485·5 | 1759·6 | 1575·3 |  |  |  |  |
| $K_3$ | 1473·8 | 1656·1 | 1750·8 |  |  |  |  |

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**Crop :- Sugarcane.** **Ref :- Ms. 60(211), 61(214).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To study the possibility of replacing organic manures partly or wholly by inorganic fertilizers.

1. BASAL CONDITIONS :

(i) (a) *Ragi*—Sugarcane. (b) *Ragi*. (c) N.A. (ii) Sandy loam. (iii) 11.1.60; 31.1.61. (iv) (a) Ploughing. (b) Planting setts. (c) 30,000 setts/ha. (d) 91 cm between rows. (e) Nil.* (v) 25 C.L./ha. of F.Y.M. (vi) Co—419. (vii) Irrigated. (viii) Digging and passing tin harrow and blade harrow 3 times. (ix) N.A. (x) 19.1.61; 30.1.62.

2. TREAPMENTS:

10 manurial treatments : $M_0$=Control (no manure), $M_1$=20 C.L /ha. of F.Y.M., $M_2$=N, P and K equivalent of $M_1$ in inorganic form, $M_3=M_1+M_2$, $M_4=M_2+M_7$, $M_5$=10 C.L./ha. of F.Y.M.+$M_7$+N, P and K equivalent of ½ of $M_2$ in inorganic form, $M_6$= $M_7$+5 C.L./ha. of F.Y.M.+N, P and K equivalent of 3/4 of $M_2$ in inorganic form, $M_7$=336 Kg/ha. of N+84 Kg/ha. of $P_2O_5$+112 Kg/ha. of $K_2O$ as top dressing, $M_8=M_7$ with N as A/S and G.N.C. in 1 : 1 ratio and $M_9=M_1+M_8$.

Equivalent of $M_2$ is 55 Kg/ha. of N+125 Kg/ha. of $P_2O_5$+251 Kg/ha. of $K_2O$ in inorganic form.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N A. (iii) 3. (iv) (a) 9·8 m.×5·5 m.; 7·3 m.×6·1 m. (b) 7·9 m.×3·7 m.; 7·3 m.×6·1 m. (v) 91 cm.×91 cm. for 60 ; Nil for 61. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of cane. (iv) (a) 1959—61. (b) No. (c) Results of combined analysis given under 5. Results. (v) N.A. (vi) Nil. (vii) Expt. no. 59(60) has also been taken while pooling. Error variances are homogeneous and Treatments×years interaction is present.

5. RESULTS :

(i) 746 Q/ha. (ii) 237·8 Q/ha. (based on 18 d.f. made up of Treatments×years interaction. (iii) Treatment differences are significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ | $M_8$ | $M_9$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 451 | 677 | 737 | 875 | 777 | 784 | 867 | 725 | 641 | 922 |

C.D.=223·4 Q/ha.

| Years | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ | $M_8$ | $M_9$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 305 | 635 | 536 | 1052 | 549 | 621 | 823 | 543 | 424 | 926 | N.S. | 641 | 187·3 |
| 1961 | 447 | 461 | 601 | 472 | 630 | 604 | 537 | 493 | 413 | 793 | N.S. | 545 | 161·9 |
| Pooled | 451 | 677 | 737 | 875 | 777 | 784 | 867 | 725 | 641 | 922 | * | 746 | 237·8 |

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**Crop :- Sugarcane (*Adsali*).** **Ref :- Ms. 60(210).**

**Site :- Reg. Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To study the possibility of replacing organic manures partly or wholly by inorganic.

1. BASAL CONDITIONS :

(i) (a) *Ragi*—Sugarcane. (b) *Ragi*. (c) N.A. (ii) Sandy loam. (iii) 16.7.1960. (iv) (a) Ploughing. (b) Planting setts. (c) 30,000 setts/ha. (d) 91 cm. between rows. (e) N.A. (v) 28 C.L./ha. of F.Y.M. at planting. (vi) Co—419. (vii) Irrigated. (viii) Digging, passing tin harrow and blade harrow 3 times. (ix) N.A. (x) 5.7.61.

2. TREATMENTS :

Same as in expt. no. 60(211), 61(214) on page 310.

3. DESIGN :

(i) R.B,D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 9·1 m.×9·1 m. (b) 7·3 m.×7·3 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Cane yield. (iv) (a) 1958—60. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 997 Q/ha. (ii) 159·7 Q/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 586 | 691 | 953 | 1170 | 1138 | 1267 | 1064 | 953 | 928 | 1220 |

C.D.=273·9 Q/ha.

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**Crop :- Sugarcane.** **Ref :- Ms. 60(206).**

**Site :- Reg. Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To study the effect of different nitrogeneous fertilizers on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Sandy loam. (iii) 3.8.1960. (iv) (a) Ploughing. (b) Planting. (c) 26 setts/row. (d) 91 cm. between rows. (e) Nil. (v) 28 C.L./ha. of F.Y.M.+84 Kg/ha. of $P_2O_5$. (vi) Co—419. (vii) Irrigated (viii) Passing blade harrow and tin harrow 3 times, weeding and interculturing. (ix) 60 cm. (x) 11.8.61.

2. TREATMENTS :

6 manurial treatments : $M_1$=C/A/N at 224 Kg/ha., $M_2$=A/C at 202 Kg/ha., $M_3$=Urea at 112 Kg/ha., $M_4$= A/S/N at 202 Kg/ha., $M_5$=C/N at 336 Kg/ha. and $M_6$=A/S at 224 Kg/ha.
All applied in 4 doses viz. 10, 20, 30 and 40 percent at planting, 6th, 10th and 14th week after planting respectively.

3. DESIGN :

(i) L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 9·8 m.×7·3 m. (b) 7·9 m.×5·5 m. (v) 91 cm. ×91 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A (iii) Yield of sugarcane. (iv) (a) 1959—60. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS .

(i) 1323 Q/ha. (ii) 208·8 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 1266 | 1335 | 1267 | 1472 | 1332 | 1265 |

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**Crop :- Sugarcane** (*Adsali*). **Ref :- Ms. 62(212).**
**Site :- Reg. Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To study the response of *ratoon* crop of Sugarcane at varying levels of N and P.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) N.A. (ii) Sandy loam. (iii) 20.9.62. (iv) (a) Ploughing. (b) Planting setts. (c) 25,000 setts/ha. approx. (d) 91 cm. between rows. (e) Nil. (v) 49·4 C.L./ha. of F.Y.M. (vi) Co—419. (vii) Irrigated. (viii) Digging, passing tin harrow and blade harrow 3 times. (ix) N.A. (x) 2.10.1963.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 2 levels of N : $N_1$=224 and $N_2$=334 Kg/ha.
(2) 3 levels of $P_2O_5$ : $P_0$=0, $P_1$=56·0 and $P_2$=112·1 Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 9·1 m.×4·6 m. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) to (c) No. (v) to (vii) N.A.

5. RESULTS :

(i) 1331 Q/ha. (ii) 279·9 Q/ha. (iii) No effect is significant. (iv) Av. yield of sugarcane in Q/ha.

| | $P_0$ | $P_1$ | $P_2$ | Mean |
|---|---|---|---|---|
| $N_1$ | 1372 | 1320 | 1305 | 1332 |
| $N_2$ | 1199 | 1387 | 1400 | 1329 |
| Mean | 1286 | 1354 | 1352 | 1331 |

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**Crop :- Sugarcane (*Main*).** **Ref :- Ms. 62(211).**

**Site :- Reg. Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To study the response of *ratoon* crop of Sugarcane at varying levels of N and P.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Sandy loam. (iii) 15.1.62. (iv) (a) Ploughing. (b) Planting setts. (c) 25,000 setts/ha. (d) 91 cm. between rows. (e) Nil. (v) 49 C.L./ha. of F.Y.M. (vi) Co–419. (vii) Irrigated. (viii) Digging and interculturing, passing blade harrow 3 times. (ix) 127 cm. (x) 5.2.63.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : $N_1$=168, $N_2$=224 and $N_3$=280 Kg/ha.
(2) 2 levels of $P_2O_5$ : $P_1$=56·0 and $P_2$=112·1 Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 9·1 m.×9 1 m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1108 Q/ha. (ii) 236·3 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

| | $N_1$ | $N_2$ | $N_3$ | Mean |
|---|---|---|---|---|
| $P_1$ | 1173 | 1147 | 1149 | 1156 |
| $P_2$ | 1075 | 943 | 1161 | 1060 |
| Mean | 1124 | 1045 | 1155 | 1108 |

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**Crop :- Sugarcane.** **Ref :- Ms. 64(113).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To compare the effects of Super vs. Thomas phos. on Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Ragi*—Sugarcane. (b) *Ragi.* (c) N.A. (ii) Sandy loam. (iii) 26.9.64. (iv) (a) Ploughing and clod crushing. (b) Planting of setts. (c) 30,000 3 eyebudded setts/ha. (d) 91 cm. between rows. (e) 1. (v) 33·6 Kg/ha. of N as A/S in 4 doses+112 Kg/ha. of $K_2O$ as Pot. Chloride in 1 dose. (vi) Co—419. (vii) Irrigated. (viii) Interculturing and weeding. (ix) 68 cm. (x) 18.1.68.

2. TAEATMENTS :

3 manurial treatments : $T_1$=84 Kg/ha. of $P_2O_5$ at planting as Super, $T_2$=84 Kg/ha. of $P_2O_5$ as Thomas Phos. at planting and $T_3$=84 Kg/ha. of $P_2O_5$ at planting as Super+CaO (form N.A.) at 186 Kg/ha.+Mg. Phos. at 9·3 Kg/ha.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) and (b) 9·1 m.×8·2 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Cane yield. (iv) (a) 1964 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 917 Q/ha. (ii) 302.5 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|
| Av. yield | 890 | 920 | 942 |

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**Crop :- Sugarcane (*Adsali*).** **Ref :- Ms. 60(189).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To study the effect of N, P and K applied individually and in combinations on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Ragi*. (c) N.A. (ii) Sandy loam. (iii) 22.6.60. (iv) (a) Ploughing, clod crushing and levelling. (b) Planting setts. (c) 29,640 (3 eyebudded) setts/ha. (d) 91 cm. between rows. (e) 1. (v) 10 C.L./ha. of F.Y.M. at planting. (vi) Co—419 (late). (vii) Irrigated. (viii) Hand weeding. (ix) N.A. (x) 30.7.61.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 levels of N as A/S : $N_1=168$, $N_2=336$ and $N_3=504$ Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_0=0$, $P_1=84$ and $P_2=168$ Kg/ha.
(3) 3 levels of $K_2O$ : $K_0=0$, $K_1=112$ and $K_2=224$ Kg/ha.

10, 20, 30 and 40 percent of N applied at planting, remaining dose 6th week, 10th week and 14th week after planting. P and K applied at planting.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 9·1 m.×9·1 m. (b) 7·3 m. ×7·3 m. (v) 91 cm. on all sides. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Tiller counts and cane yield. (iv) (a) 1958—61 (crop seasons differ). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1445·8 Q/ha. (ii) 266·1 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 1513·9 | 1381·5 | 1298·0 | 1384·8 | 1408·5 | 1400·1 | 1397·8 |
| $N_2$ | 1341·0 | 1613·3 | 1312·2 | 1416·2 | 1433·9 | 1416·5 | 1422·2 |
| $N_3$ | 1487·4 | 1588·5 | 1476·3 | 1401·4 | 1489·3 | 1661·6 | 1517·4 |
| Mean | 1447·5 | 1527·8 | 1362·2 | 1400·8 | 1443·9 | 1492·7 | 1445·8 |
| $K_0$ | 1424·8 | 1415·8 | 1361·8 | | | | |
| $K_1$ | 1495·5 | 1479·6 | 1356·6 | | | | |
| $K_2$ | 1422·1 | 1687·9 | 1368·2 | | | | |

**Crop :- Sugarcane** (*Annual*). **Ref :- Ms. 61(188).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To study the effect of N, P and K applied individually and in combinations on the yield of of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Sandy loam. (iii) 28.1.61. (iv) (a) Ploughing, clod crushing and levelling. (b) Planting. (c) 29,640 (3 eye budded) setts/ha. (d) 91 cm. between rows (e) 1. (v) 10 C.L./ha. of F.Y.M. at planting. (vi) Co–419 (late). (vii) Irrigated. (viii) Hand weeding. (ix) N.A. (x) 30.1.62.

2. TREATMENT :

Same as in expt. no. 60(189) on page no. 314.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 15·2 m.×6·4 m. (b) 13·4 m.×4·6 m. (v) 91 cm. on all sides. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Tiller count and cane yield. (iv) (a) 1958–61 (seasons differ). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 743·2 Q/ha. (ii) 171·1 Q/ha. (iii) Main effect of P is significant. (iv) Av. yield of sugarcane in Q/ha.

|  | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 676·4 | 669·0 | 787·3 | 644·3 | 676·6 | 811·9 | 710·9 |
| $N_2$ | 663·9 | 797·3 | 807·5 | 727·0 | 772·8 | 769·0 | 756·3 |
| $N_3$ | 696·0 | 708·7 | 882·8 | 733·3 | 856·3 | 697·7 | 762·4 |
| Mean | 678·9 | 725·0 | 825·8 | 701·5 | 768·6 | 759·5 | 743·2 |
| $K_0$ | 663·6 | 689·3 | 751·7 |  |  |  |  |
| $K_1$ | 663·7 | 784·6 | 857·5 |  |  |  |  |
| $K_2$ | 709·1 | 701·3 | 868·2 |  |  |  |  |

C.D. for P marginal means=119·8 Q/ha.

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**Crop :- Sugarcane** (*Adsali*). **Ref :- Ms. 61(191).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To study the effect of compound fertilizers like Mg phos. and Nitro-phos. on the yield of Cane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fodder. (c) N.A. (ii) Sandy loam. (iii) 27.9.61. (iv) (a) Ploughing, clod crushing and levelling. (b) Planting setts. (c) 29,640 (3 eye budded) setts/ha. (d) 91 cm. between rows. (e) 1. (v) 25 C.L./ha. of F.Y.M. (vi) Co—419 (late). (vii) Irrigated. (viii) 2 to 3 hand weedings and intercultivating by bullocks and earthing up. (ix) N.A. (x) 15.1.63.

2. TREATMENTS:

4 fertilizers : $T_1$=134 Kg/ha. of N as A/s+79 Kg/ha. of $P_2O_5$ as Super at 14th week of planting and 33 Kg/ha. of $P_2O_5$ as Super at planting, $T_2$=Same as $T_1$ source of $P_2O_5$ is Mg. Phos., $T_3$=56 Kg/ha. of N as A/S+79 Kg/ha. of N+79 Kg/ha. of $P_2O_5$ as Nitro-phos. at 14th week of planting and 33 Kg/ha. of $P_2O_5$ as O.D.D.A. at planting and $T_4$=40 Kg/ha. of N as A/S+92 Kg/ha. of N and 83 Kg/ha. of $P_2O_5$ as Nitrophos. at 14th week of planting and 29 Kg/ha. of $P_2O_5$ as PEC at planting.

33, 67 and 101 Kg/ha. of N as A/S applied at planting, 6th week and 10th week after planting to all the plots.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 8·2 m.×9·1 m. (b) 6·4 m.×7·3 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) 2—4, D weedicide sprayed 2 to 3 days after planting. (iii) Tillering counts and yield of cane. (iv) (a) 1961—63 (Treatments modified in 1962). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1406·8 Q/ha. (ii) 202·8 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 1400·4 | 1383·4 | 1300·1 | 1543·5 |

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**Crop :- Sugarcane (*Adsali*).** **Ref :- Ms. 62(215), 63(199).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To study the effect of compound fertilizers on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Ragi*—Sugarcane. (b) *Ragi.* (c) N.A. (ii) Sandy loam. (iii) 15.10.62; 13.9.63. (iv) (a) Ploughing. (b) Planting setts. (c) 30,000 setts/ha. (approximately). (d) 91 cm. between rows. (e) Nil. (v) 25 C.L./ha. of F.Y.M. (vi) Co—419 (late). (vii) Irrigated. (viii) Digging and earthing up. (ix) N.A. (x) 4.12.1963 ; N.A.

2. TREATMENTS :

5 fertilizers : $T_1$=134·4 Kg/ha. of N as A/S+78·4 Kg/ha. of $P_2O_5$ as Super at 14th week of planting and 33·6 Kg/ha. of $P_2O_5$ as Super at planting, $T_2$=As $T_1$ except source of $P_2O_5$ is Mg. Phos., $T_3$=56·0 Kg/ha. of N as A/S+78·4 Kg/ha. of N+78·4 Kg/ha. of $P_2O_5$ at 14th week of planting and 33·6 Kg/ha. of $P_2O_5$ at planting (source—Nitrophos. and O.D.D.A.), $T_4$=41·4 Kg/ha. of N as A/S+93·0 Kg/ha. of N+82·9 Kg/ha. of $P_2O_5$ at 14th week of planting and 29·1 Kg/ha. of $P_2O_5$ at planting (source—Nitrophos. and O.D.D.A.) and $T_5$=106·4 Kg/ha. of N as A/S+28·0 Kg/ha. of N+78·4 Kg/ha. of $P_2O_5$ at 14th week of planting+33·6 Kg/ha. of $P_2O_5$ as Ammo. Phos. at planting.

33·6, 67·2 and 100·8 Kg/ha of N applied at planting, 6th and 10th week of planting to all the plots, source of N for $T_1$ to $T_4$ is A/S and for $T_5$ is A/S and Ammo. Phos. in 2 : 1 ratio.

3. DESIGN :

(i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 9·1 m.×8·2 m. (b) 9·1 m.×6·4 m. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of Cane. (iv) (a) 1961—63 (Treatments modified in 62). (b) No. (c) Nil (v) and (vi) Nil. (vii) Variances are heterogeneous and Treatments×years interaction is absent.

5. RESULTS :

**62(215)**

(i) 1495 2 Q/ha (ii) 252·6 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. yield | 1647 0 | 1500·1 | 1474·5 | 1416·8 | 1437·6 |

**63(199)**

(i) 1032·2 Q/ha (ii) 475·2 Q/ha, (iii) Treatment differences are not significant. (iv) Av. yield of Cane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. yield | 1044·4 | 1091·3 | 1102·4 | 1014·6 | 908·4 |

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**Crop :- Sugarcane (*Adsali*).** **Ref :- Ms. 60(191).**

**Site Sugarcane Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To study the suitable carrier and placement method of phosphate for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Ragi*—Sugarcane. (b) *Ragi*. (c) 33 6 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+67·2 Kg/ha. of $K_2O$. (ii) Sandy loam. (iii) 18.8.60. (iv) (a) Ploughing, clod crushing and levelling. (b) Planting setts. (c) 29,640 (3 budded) setts/ha. (d) 91 cm. within rows. (e) Nil. (v) 25 C.L./ha. of F.Y.M.+33·6 Kg/ha. of N as A/S in 4 doses. (vi) Co-419 (late). (vii) Irrigated. (viii) Hand weeding, intercultivation and earthing up. (ix) N.A. (x) 12.8.61.

2. TREATMENTS :

All combinations of (1), (2) and (3).

(1) 2 levels of $P_2O_5$ : $P_0$=0 and $P_1$=112 Kg/ha.
(2) 2 depths of placement : $S_1$=Surface and $S_2$=10 cm. deep.
(3) 3 methods of application : $M_0$=No mixing, $M_1$=Mixing with cowdung and $M_2$=Mixing with compost.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N A. (iii) 4. (iv) (a) 9·1 m.×7·3 m. (b) 7·3 m.×5·5 m. (v) 91 cm.× 91 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) 2--4, D was sprayed. (iii) Tiller count and yield of cane. (iv) (a) 1958 to 65 (treatments modified every year till 1962). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1136·1 Q/ha. (ii) 108·7 Q/ha. (iii) P effect is highly significant, while M effect is significant. (iv) Av. yield of cane in Q/ha.

|  | $S_1$ | $S_2$ | $M_0$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|---|---|
| $P_0$ | 1007·6 | 1004·8 | 1019·0 | 1059·8 | 939·8 | 1006·2 |
| $P_1$ | 1279·7 | 1252·3 | 1232·1 | 1321·2 | 1244·6 | 1266·0 |
| Mean | 1143·6 | 1128·6 | 1125·6 | 1190·5 | 1092·2 | 1136·1 |
| $M_0$ | 1162·6 | 1088·5 |  |  |  |  |
| $M_1$ | 1200·3 | 1180·7 |  |  |  |  |
| $M_2$ | 1068·0 | 1116·5 |  |  |  |  |

**Crop :- Sugarcane** *(Adsali)*. **Ref :- Ms. 61(194).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To study the suitable carrier and placement method of phosphate for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Ragi*—Sugarcane. (b) *Ragi*. (c) 33 Kg/ha. of N+33 Kg/ha. of $P_2O_5$+67 Kg/ha. of $K_2O$. (ii) Sandy loam. (iii) 23.8.1961. (iv) (a) Ploughing, clod crushing and levelling. (b) Planting setts. (c) 3 eyebudded 29640 setts/ha. (d) 91 cm. within rows. (e) Nil. (v) 25 C.L./ha. of F.Y.M.+336 Kg/ha. of N as A/S in 4 doses. (vi) Co—419 (late). (vii) Irrigated. (viii) Hand weeding, intercultivation and earthing up. (ix) Normal. (x) 30.11.1962.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 3 levels of $P_2O_5$ : $P_1$=56, $P_2$=112 and $P_3$=168 Kg/ha.
(2) 2 depths of placement : $S_1$=Surface and $S_2$=10 cm. deep.
(3) 2 methods of application : $M_0$=No mixing and $M_1$=Mixing with cowdung.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) and (b) 9·1 m.×8·2 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) 2—4, D was sprayed. (iii) Tiller count and yield of cane. (iv) (a) 1958 to 65 (modified every year till 62). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 1412·7 Q/ha. (ii) 228·7 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

| | $P_1$ | $P_2$ | $P_3$ | $M_0$ | $M_1$ | Mean |
|---|---|---|---|---|---|---|
| $S_1$ | 1330·1 | 1403·1 | 1440·1 | 1343·4 | 1438·8 | 1391·1 |
| $S_2$ | 1453·2 | 1369·9 | 1479·7 | 1402·7 | 1465·9 | 1434·3 |
| Mean | 1391·6 | 1386·5 | 1459·9 | 1373·0 | 1452·4 | 1412·7 |
| $M_0$ | 1366·4 | 1364·8 | 1387·8 | | | |
| $M_1$ | 1416·9 | 1408·2 | 1532·0 | | | |

* * *

**Crop :- Sugarcane.** **Ref :- Ms. 62(174).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To study the suitable carrier and placement method of phosphate for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Ragi*—Sugarcane. (b) *Ragi*. (c) 33 Kg/ha. of N+33 Kg/ha. of $P_2O_5$+67 Kg/ha. of $K_2O$. (ii) Sandy loam. (iii) 29.8.62. (iv) (a) Ploughing, clod crushing and levelling. (b) Planting. (c) 29640 3 eye budded (d) 91 cm. within rows. (e) Nil. (v) 25 C.L./ha. of F.Y.M.+336 Kg/ha. of N as A/S in 4 doses. setts/ha. (vi) Co—419 (late). (vii) Irrigated. (viii) Hand weeding, intercultivation and earthing up. (ix) N.A. (x) 5.11.63.

2. TREATMENTS :

All combinations of (1), (2) and (3).

(1) 2 levels of $P_2O_5$ : $P_1$=84 and $P_2$=168 Kg/ha.

(2) 2 levels of compost carrier : $C_0$=0 and $C_1$=Compost carrier mixed with cowdung.

(3) 3 times of application : $T_1$=Full dose at planting, $T_2$=Full dose at earthing up and $T_3$=½ at planting and ½ at earthing up.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) and (b) 9·1 m.×9·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) 2–4, D was sprayed. (iii) Tiller count and yield of cane. (iv) (a) 1958—65 (modified every year till 62). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 1549·3 Q/ha. (ii) 214·5 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

| | $T_1$ | $T_2$ | $T_3$ | $C_0$ | $C_1$ | Mean |
|---|---|---|---|---|---|---|
| $P_1$ | 1546·8 | 1468·2 | 1566·8 | 1490·8 | 1563·8 | 1527·3 |
| $P_2$ | 1528·9 | 1598·8 | 1586·3 | 1584·0 | 1558·6 | 1571·3 |
| Mean | 1537·8 | 1533·5 | 1576·6 | 1537·4 | 1561·2 | 1549·3 |
| C | 1525·3 | 1495·6 | 1591·3 | | | |
| $C_1$ | 1550·4 | 1571·4 | 1561·8 | | | |

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**Crop :- Sugarcane.** **Ref :- Ms. 63(198), 64(158), 65(36).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To study the suitable carrier and placement method of phosphate for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Ragi*—Sugarcane. (b) *Ragi*. (c) Sandy loam. (iii) 18.8.63; 27.9.64; 20.9.65. (iv) (a) Ploughing. (b) Planting. (c) 30,000 setts/ha. (approx). (d) 91 cm. between rows. (e) 1. (v) 25 C.L./ha. of F.Y.M.+ 336 Kg/ha. of N as A/S in 4 doses. (vi) Co—419. (vii) Irrigated. (viii) Digging and earthing up in 1963, 64; Hand weeding, 2 to 3 interculturings and earthing up in 65. (ix) N.A. (63, 64); 108 cm. (x) N.A.; 21 to 23.1.66; 18 to 20.1.67.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 levels of $P_2O_5$ : $P_1$=84 and $P_2$=168 Kg/ha.

(2) 3 carriers : $C_0$=No carrier, $C_1$=Compost carrier and $C_2$=*Sannhemp* carrier i.e. G.M.

(3) 3 times of application : $T_1$=Full dose at planting, $T_2$=Full dose at earthing up and $T_3$=Half at planting and half at earthing up.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 2. (iv) (a) 9·1 m.×9·1 m. (b) 9·1 m.×7·3 m. (v) and (vi) Yes.

### 4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of cane. (iv) (a) 1958 to 65 (Treatments modified every year till 62). (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous. Treatments×years interaction is absent.

### 5. RESULTS :

(i) 1529·0 Q/ha. (ii) 220 4 Q/ha. (based on 77 d.f. made up of pooled error and Treatments×years interaction). (iii) Interaction P×C alone is significant. (iv) Av. yield of cane in Q/ha.

| | $C_0$ | $C_1$ | $C_2$ | $T_1$ | $T_2$ | $T_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $P_1$ | 1421 | 1564 | 1585 | 1451 | 1546 | 1571 | 1523 |
| $P_2$ | 1575 | 1560 | 1469 | 1484 | 1560 | 1561 | 1535 |
| Mean | 1498 | 1562 | 1527 | 1468 | 1553 | 1566 | 1529 |
| $T_1$ | 1495 | 1426 | 1483 | | | | |
| $T_2$ | 1508 | 1604 | 1548 | | | | |
| $T_3$ | 1492 | 1657 | 1550 | | | | |

C.D. for body of P×C table=146·9 Q/ha.

| Years | $C_0$ | $C_1$ | $C_2$ | Sig. | $T_1$ | $T_2$ | $T_3$ | Sig. |
|---|---|---|---|---|---|---|---|---|
| 1963 | 1414 | 1480 | 1503 | N.S. | 1406 | 1444 | 1547 | N.S. |
| 1964 | 1650 | 1715 | 1626 | N.S. | 1578 | 1742 | 1671 | N.S. |
| 1965 | 1430 | 1491 | 1452 | N.S. | 1419 | 1474 | 1480 | N.S. |
| Pooled | 1498 | 1562 | 1527 | N.S. | 1468 | 1553 | 1566 | N.S. |

| $P_1$ | $P_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|
| 1456 | 1475 | N.S. | 1466 | 224·1 |
| 1637 | 1691 | N.S. | 1664 | 240·6 |
| 1476 | 1439 | N.S. | 1458 | 264·3 |
| 1523 | 1535 | N.S. | 1529 | 220·4 |

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**Crop :- Sugarcane.** **Ref :- Ms. 63(250), 64(208), 65(90).**
**Site :- Agri. Res. Stn., Sankeswar.** **Type :- 'M'.**

Object :—To find out the suitable N, P and K manurial schedule for the Sugarcane crop grown under lift irrigation tract.

### 1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (b) Medium black soil. (iii) 21.1.63; 6.2.64; 25.2.65. (iv) (a) Ploughing and harrowing. (b) Wet method. (c) 24710 (3 eyebuded) setts/ha. (d) 91 cm. (e) Nil. (v) 24·7 C.L./ha. of F.Y.M. (vi) Co—419. (vii) Irrigated. (viii) 2 weedings and earthings. (ix) 93 cm.; 77 cm.; 61 cm. (x) 2nd week of Jan. 64; 11.1.65; 26.2.66.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 levels of N : $N_1$=224 and $N_2$=336 Kg/ha.
(2) 2 levels of $P_2O_5$ : $P_0$=0 and $P_1$=84 Kg/ha.
(3) 3 levels of $K_2O$ : $K_1$=84, $K_2$=168 and $K_3$=225 Kg/ha.

10% of N and full dose of P and K applied in one dose at planting.
20%, 30% and 40% of N applied after 6th, 10th and 14th week of planting.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10·7 m.×6·1 m. for 63 : 12·2 m.× 5·5 m. for 64 and 65. (v) 150 cm. alround. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of cane. (iv) (a) 1963 to 65. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent.

5. RESULTS :

63(250)

(i) 1503·3 Q/ha. (ii) 277·7 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

| | $P_0$ | $P_1$ | $K_1$ | $K_2$ | $K_3$ | Mean |
|---|---|---|---|---|---|---|
| $N_1$ | 1572·8 | 1533·2 | 1551·5 | 1531·2 | 1576·3 | 1553·0 |
| $N_2$ | 1393·8 | 1513·4 | 1581·9 | 1441·6 | 1337·3 | 1453·6 |
| Mean | 1483·3 | 1523·3 | 1566·7 | 1486·4 | 1456·8 | 1503·3 |
| $K_1$ | 1621·5 | 1511·9 | | | | |
| $K_2$ | 1443·9 | 1528·9 | | | | |
| $K_3$ | 1384·5 | 1529·2 | | | | |

64(208)

(i) 1249·1 Q/ha. (ii) 162·9 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

| | $P_0$ | $P_1$ | $K_1$ | $K_2$ | $K_3$ | Mean |
|---|---|---|---|---|---|---|
| $N_1$ | 1222·3 | 1223·6 | 1234·4 | 1274·6 | 1159·9 | 1223·0 |
| $N_2$ | 1229·6 | 1320·7 | 1241·2 | 1272·8 | 1311·4 | 1275·2 |
| Mean | 1226·0 | 1272·2 | 1237·8 | 1273·7 | 1235·7 | 1249·1 |
| $K_1$ | 1175·9 | 1299·7 | | | | |
| $K_2$ | 1284·5 | 1262·9 | | | | |
| $K_3$ | 1217·5 | 1253·9 | | | | |

65(90)

(i) 1022·3 Q/ha. (ii) 138·6 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

| | $P_0$ | $P_1$ | $K_1$ | $K_2$ | $K_3$ | Mean |
|---|---|---|---|---|---|---|
| $N_1$ | 1021·8 | 1028·3 | 993·2 | 1072·5 | 1009·4 | 1025·0 |
| $N_2$ | 991·7 | 1047·2 | 968·8 | 1027·9 | 1061·8 | 1019·5 |
| Mean | 1006·8 | 1037·8 | 981·0 | 1050·2 | 1035·6 | 1022·3 |
| $K_1$ | 995·0 | 967·1 | | | | |
| $K_2$ | 1019·2 | 1081·2 | | | | |
| $K_3$ | 1006·2 | 1065·0 | | | | |

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**Crop :- Sugarcane.** **Ref :- Ms. 60(288), 61(277), 62(284).**

**Site :- Agri. Res. Stn., Sankeswar.** **Type :- 'M'.**

Object :—To evolve suitable manurial schedule for medium rainfall area of Belgaum zone under lift irrigation tract.

1. BASAL CONDITIONS :

(i) (a) Groundnut—*Jowar*—Sugarcane. (b) Groundnut—*Jowar* mixture (1960); Chillies 1961; N.A. (c) N.A. (1960); 44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$ (1961); N.A. (ii) Medium black. (iii) 1.3.60; 29.1.61; N.A. (iv) (a) Ploughing and harrowing. (b) Wet method. (c) 24,700 3 eyebudded setts/ha. (d) 91 cm. between rows. (e) 1. (v) 24·7 C.L./ha. of F.Y.M. or T.C. (vi) Co—419 (vii) Irrigated. (viii) 3 weedings and earthing up 5 cm. and propping 2·5 cm. (ix) 100 cm. ; 115 cm. ; N.A. (x) 1.2.61; 2nd week of Jan. '62 ; N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3).

(1) 3 levels of N : $N_1$=168, $N_2$=252 and $N_3$=336 Kg/ha.
(2) 3 levels of $P_2O_5$ : $P_0$=0, $P_1$=56 and $P_2$=112 Kg/ha.
(3) 3 levels of $K_2O$ : $K_0$=0, $K_1$=84 and $K_2$=168 Kg/ha.

10% of N and full dose of $P_2O_5$ and $K_2O$ applied at planting. The rest of N applied in 3 doses at 20%, 30% and 40%. (Details N.A.)

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 13·7 m.×7·0 m. (1960 and 62); 10·7 m.×5·5 m. (1961). (b) 12·2 m.×5·5 m. (1960 and 62); 9·1 m.×4·6 m. for 61. (v) 1·5m. ring. (vi) Yes.

4. GENERAL :

(i) Fair. Lodged to some extent. (ii) Top shoot borer and leaf spots and stem borer. (iii) Cane yield. (iv) (a) 1960 to 62. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous. Treatments×years interaction is absent.

5. RESULTS :

**60(288)**

(i) 1687·4 Q/ha. (ii) 168·0 Q/ha. (iii) Main effects of N and K are highly significant. (iv) Av. yield of cane in Q/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mea |
|---|---|---|---|---|---|---|---|
| $N_1$ | 1598·5 | 1571·8 | 1573·7 | 1444·5 | 1534·1 | 1765·0 | 1581·2 |
| $N_2$ | 1606·6 | 1786·2 | 1765·9 | 1674·7 | 1744·4 | 1739·6 | 1719·6 |
| $N_3$ | 1809·4 | 1693·8 | 1781·5 | 1622·7 | 1892·9 | 1769·2 | 1761·6 |
| Mean | 1671·5 | 1683·9 | 1706·9 | 1580·6 | 1723·8 | 1757·9 | 1687·4 |
| $K_0$ | 1635·5 | 1535·5 | 1570·9 | | | | |
| $K_1$ | 1748·5 | 1715·5 | 1707·4 | | | | |
| $K_2$ | 1630·6 | 1800·7 | 1842·5 | | | | |

C.D. for N or K marginal means=115·6 Q/ha.

**61(277)**

(i) 1489·9 Q/ha. (ii) 108·1 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 1503·9 | 1356·6 | 1518·7 | 1484·6 | 1423·2 | 1471·3 | 1459·7 |
| $N_2$ | 1522·2 | 1512·7 | 1526·9 | 1495·6 | 1507·4 | 1558·7 | 1520·6 |
| $N_3$ | 1522·4 | 1471·1 | 1474·7 | 1449·7 | 1534·5 | 1484·0 | 1489·4 |
| Mean | 1516·2 | 1446·8 | 1506·7 | 1476·6 | 1488·4 | 1504·7 | 1489·9 |
| $K_0$ | 1513·6 | 1444·9 | 1471·4 | | | | |
| $K_1$ | 1540·6 | 1412·5 | 1512·5 | | | | |
| | 1494·3 | 1482·9 | 1536·8 | | | | |

**62(284)**

(i) 1120·3 Q/ha. (ii) 110·1 Q/ha. (iii) Main effects of N and P and interactions N×K are significant. (iv) Av. yield of cane in Q/ha.

| | $P_0$ | $P_1$ | $P_2$ | | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 1026·3 | 1031·0 | 1127·7 | 1053·5 | 1045·0 | 1086·6 | 1061·7 |
| $N_2$ | 1039·8 | 1145·7 | 1186·0 | 1060·4 | 1214·7 | 1096·3 | 1123·8 |
| $N_3$ | 1184·3 | 1115·0 | 1226·9 | 1237·6 | 1085·1 | 1203·5 | 1175·4 |
| Mean | 1083·5 | 1097·2 | 1180·2 | 1117·2 | 1114·9 | 1128·8 | 1120·3 |
| $K_0$ | 1058·5 | 1110·5 | 1182·6 | | | | |
| $K_1$ | 1102·1 | 1053·7 | 1189·0 | | | | |
| $K_2$ | 1089·9 | 1127·5 | 1169·1 | | | | |

C.D. for N or P marginal means=75·7 Q/ha.
C.D. for body of N×K table =131·1 Q/ha.

**Crop :- Sugarcane (*Annual*).**

**Ref :- Ms. 63, 64, 65 (S.F.T.) for Belgaum 62, 64, (S.F.T.) for Hassan, 65(S.F.T.) for Mandya, 63, 65 (S.F.T.) for N. Kanara, 63, 64 (S.F.T.) for Shimoga.**

**Site :- (District) : Belgaum, Hassan, Mandya, N. Kanara and Shimoga.**

**Type :- 'M'.**

Object :—Type $A_1$ : To study the response curves of important cereal, cash and oilseed crops to N applied singly and in combination with other nutrients.

1- BASAL CONDITIONS :

(i) N.A. (ii) Deep black for Belgaum ; laterite for N. Kanara and red sandy for others. (iii) to (vi) N.A. (vii) Unirrigatd. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :

O =Control (no manure).
$N_1$ =15 Kg/ha. of N.
$N_2$ =30 Kg/ha. of N.
$P_1$ =30 Kg/ha. of $P_2O_5$.
$N_1P_1$ =15 Kg/ha. of N+30 Kg/ha. of $P_2O_5$.
$N_2P_1$ =30 Kg/ha. of N+30 Kg/ha. of $P_2O_5$.
$N_2P_2$ =30 Kg/ha. of N+60 Kg/ha. of $P_2O_5$.
$N_2P_2K_1$ =30 Kg/ha. of N+60 Kg/ha. of $P_2O_5$+35 Kg/ha. of $K_2O$.

N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

(i) and (ii) A selected district is divided into four agriculturally homogeneous zones based on climate, soil, cropping pattern, etc. In each zone one block is selected at random. A block normally consists of a group of 50-100 villages. In each block 36 experiments are conducted in a year of which 11 are of type $A_1$, 11 of type $A_2$, 11 of type $A_3$ and 3 are of type C. The eleven experiments under type $A_1$, $A_2$ and $A_3$ are distributed as 3 on a *Kharif* cereal, 3 on a *rabi* cereal, 3 on a cash crop and 2 on oilseed. All the three type C experiments are conducted on a legume crop. For the purpose of conducting the $A_1$, $A_2$ and $A_3$ experiments 11 villages are randomly selected in each block and in each village 3 experiments one each of type $A_1$, $A_2$ and $A_3$ are laid out. For conducting the three type C trials three villages are randomly selected in each block. (iii) (a) 1/100 ha. (b) 1/200 ha. (iv) Yes.

4. GENERAL :-

(i) to (iii) N.A. (iv) (a) 1962 to 1964 for Hassan [1963 N.A.] ; 1963 to 1964 for Shimoga ; 1963 to 1966 [1964 N.A. for N. Kanara] for Belgaum and N. Kanara ; 1965 only for Mandya. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**Belgaum**

63(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 143·5 | 224·4 | 70·7 | 192·3 | 252·4 | 283·8 | 331·8 | 16·3 |

Control yield=904·4 Q/ha. ; No. of trials=10.

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 140·9 | 275·4 | 89·8 | 175·1 | 316·2 | 411·6 | 486·7 | 19·4 |

Control yield=969·4 Q/ha. ; No. of trials=10.

65(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 136·7 | 235·1 | 102·7 | 188·4 | 265·5 | 322·9 | 386·7 | 26·7 |

Control yield=1220 Q/ha. ; No. of trials=7.

Hassan

62(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 110·3 | 57·4 | 46·6 | 183·3 | 133·6 | 91·5 | 278·9 | 63.9 |

Control yield=1413·1 Q/ha. ; No. of trials=2.

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 37·6 | 69·6 | −8·9 | 99·0 | 45·4 | 122·6 | 178·8 | 45·4 |

Control yield=850·0 Q/ha. ; No. of trials=3.

Mandya

65(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 35·0 | 104·0 | 82·0 | 60·0 | 116·0 | 167·0 | 168·0 | 35·6 |

Control yield=1105·1 Q/ha. ; No. of trials=2.

N. Kanara

63(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 49·9 | 103·2 | 31·2 | 60·7 | 116·1 | 131·3 | 146·4 | 8·6 |

Control yield=768·7 Q/ha. ; No. of trials=10.

65(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 62·9 | 106·0 | 51·7 | 91·8 | 167·0 | 195·8 | 261·7 | 19·0 |

Control yield=1254·5 Q/ha. ; No. of trials=8.

Shimoga

63(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 33·5 | 55·9 | 99·2 | 96·3 | 111·3 | 152·3 | 173·2 | 28·6 |

Control yield=636 Q/ha. ; No. of trials=6.

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 88·3 | 145·0 | 97·5 | 223·4 | 280·0 | 151·6 | 314·3 | 74·5 |

Control yield=819·7 Q/ha. ; No. of trials=3.

**Crop :- Sugarcane (*Annual*).**

**Ref :- Ms. 63, 64,65 (S.F.T.) for Belgaum; 62, 64, (S.F.T.) for Hassan ; 65, (S.F.T.) for Mandya; 63,65 (S.F.T.) for N. Kanara and 63, 64 (S.F.T.) for Shimoga.**

**Site :- (District) : Belgaum, Hassan, Mandya, N. Kanara and Shimoga.**

**Type :- 'M'.**

Object :—Type $A_2$ : To study the response curves of important cereal, cash and oilseed crops to Phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Deep black for Belgaum ; Laterite for N. Kanara and Red sandy for others. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:

8 manurial treatments :

O=Control (no manure).
$N_1$=15 Kg/ha. of N.
$P_1$=30 Kg/ha. of $P_2O_5$.
$P_2$=60 Kg/ha. of $P_2O_5$.
$N_1P_1$=15 Kg/ha. of N+30 Kg/ha. of $P_2O_5$.
$N_1P_2$=15 Kg/ha. of N+60 Kg/ha. of $P_2O_5$.
$N_2P_2$=30 Kg/ha. of N+60 Kg/ha. of $P_2O_5$.
$N_2P_2K_2$=30 Kg/ha. of N+60 Kg/ha. of $P_2O_5$+60 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in type $A_1$ on page 324.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962 to 1964 [1963 N.A.] for Hassan ; 1965 only for Mandya ; 1963 to 1964 for Shimoga ; 1963 to 1966 [1964 N.A. for N. Kanara] for others. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**Belgaum**

63(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 157.8 | 95·3 | 143·4 | 195·1 | 243·2 | 282·5 | 333·7 | 24·9 |

Control yield=837·8 Q/ha. ; No. of trials=11.

64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 115·6 | 61·6 | 178·5 | 124·5 | 225·5 | 376·3 | 431·9 | 25·2 |

Control yield=925·4 Q/ha. ; No. of trials=9.

65(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 116·4 | 41·5 | 150·2 | 140·2 | 55·3 | 224·2 | 238·7 | 29·7 |

Control yield=1226 Q/ha. ; No. of trials=7.

**Hassan**

62(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 91·5 | 39·4 | 98·7 | 14·3 | 148·0 | 202·7 | 212·5 | 41·4 |

Control yield=1029 Q/ha. ; No. of trials=2.

64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 70·2 | 49·3 | 90·6 | 70·4 | 138·4 | 125·2 | 197·8 | 28·3 |

Control yield=717 Q/ha. ; No. of trials=3.

**Mandya**

65(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 29·0 | 60·0 | 16·0 | 112·0 | 153·0 | 203·0 | 258·0 | 77·4 |

Control yield=1089 Q/ha. ; No. of trials=3.

**N. Kanara**

63(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 1·9 | 55·8 | 42·4 | 44·7 | 97·5 | 142·5 | 114·4 | 35·0 |

Control yield=748·9 Q/ha. ; No. of trials=9.

65(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 68·7 | 35·9 | 71·9 | 106·4 | 145·8 | 200·7 | 234·4 | 17·2 |

Control yield=1170·7 Q/ha ; No. of trials=8.

**Shimoga**

63(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 53·6 | 61·1 | 67·7 | 74·5 | 39·4 | 103·2 | 114·9 | 12·5 |

Control yield=680 Q/ha. ; No. of trials=3.

64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 53·4 | 27·7 | −9·9 | 36·9 | 26·3 | 105·4 | 237·2 | 72·5 |

Control yield=968·6 Q/ha. ; No. of trials=3.

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**Crop :- Sugarcane** (*Annual*).

**Ref :- Ms. 63 to 65(S.F.T.) for Belgaum ; 62, 64 (S.F.T.) for Hassan; 65 (S.F.T.) for Mandya ; 63, 65 (S.F.T.) for N. Kanara and 63, 64 (S.F.T.) for Shimoga.**

**Site :- (District) : Balgaum, Hassan, Mandya, N. Kanara and Shimoga.**

**Type :- 'M'.**

Object :—Type $A_3$ : To study the response curves of important cereal, cash and oilseed crops to potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Deep black for Belgaum ; Laterite for N. Kanara and Red sandy for others. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :

O =Control (no manure).
$N_1$ =15 Kg/ha. of N.
$K_1$ =30 Kg/ha. of $K_2O$.
$K_2$ =60 Kg/ha. of $K_2O$.
$N_1K_1$ =15 Kg/ha. of N+30 Kg/ha. of $K_2O$.
$N_1K_2$ =15 Kg/ha. of N+60 Kg/ha. of $K_2O$.
$N_2K_2$ =30 Kg/ha. of $P_2O_5$+60 Kg/ha. of $K_2O$.
$N_1P_1K_1$ =15 Kg/ha. of N+30 Kg/ha. of $P_2O_5$+30 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in Type $A_1$ on page 324.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962 to 1964 [1963—N.A.] for Hassan ; 1963 to 1964 for Shimoga ; 1965 only for Mandya and 1963 to 1966 [1964—N.A. for N. Kanara] for others. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**Belgaum**

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 149·5 | 63·4 | 172·8 | 88·0 | 205·5 | 269·6 | 217·3 | 18·7 |

Control yield=907 Q/ha. ; No. of trials=10.

64(S.F T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | —282·0 | 84·2 | —241·0 | 103·8 | —259·0 | —141·3 | —200·4 | 18·5 |

Control yield= 1155·6 Q/ha. ; No. of trials=10.

65(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 122·9 | 50·9 | 30·9 | 131·5 | 147·1 | 238·6 | 190·9 | 22·4 |

Control yield=1123 Q/ha. ; No. of trials=9.

**Hassan**

62(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 23·7 | 13·6 | 74·4 | 130·3 | 24·8 | 209·2 | 222·8 | 95·4 |

Control yield=1310 Q/ha. ; No. of trials=2.

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 46·4 | 66·2 | 115·4 | 58·1 | 99·3 | 180·1 | 165·3 | 35·1 |

Control yield=762·3 Q/ha. ; No. of trials=2.

**Mandya**

65 (S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 49·0 | 74·0 | 89·0 | 133·0 | 127·0 | 142·0 | 102·0 | 24·5 |

Control yield=933 Q/ha. ; No. of trials=2.

**N. Kanara**

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 61·9 | 26·1 | 69·4 | 35·1 | 81·5 | 135·3 | 95·7 | 85·4 |

Control yield=731 Q/ha. ; No. of trials=10.

65(S.F.T,)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 79·4 | 39·8 | 51·3 | 107·4 | 120·3 | 176·5 | 196·1 | 18·3 |

Control yield=1110 Q/ha.; No. of trials=8.

**Shimoga**

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 2·5 | 16·8 | 46·9 | 67·6 | 124·1 | 98·0 | 96·0 | 30·1 |

Control yield=558 Q/ha. ; No. of trials=6.

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $F_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of cane in Q/ha. | 47·4 | 38·2 | 137·1 | 14·5 | 102·8 | 199·0 | 295·2 | 38·7 |

Control yield=753·8 Q/ha. ; No. of trials=3.

**Crop :- Sugarcane.** **Ref :- Ms. 62(152).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'MV'.**

Object :—To sudy the effect of different levels of N on the two varieties of Cane.

1. BASAL CONDITIONS :

(i) (a) *Ragi*—Sugarcane. (b) *Ragi.* (c) N.A. (ii) Sandy loam. (iii) 13.9.1962. (iv) (a) Ploughing. (b) Planting setts. (c) 30,000 setts/ha. (3 eyebuds/sett). (d) 91 cm. between rows. (e) —. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Interculturing and weeding. (ix) 127 cm. (x) 2, 3.11.1963.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 levels of N as A/S : $N_1=168$, $N_2=224$ and $N_3=280$ Kg/ha.
(2) 2 varieties : $V_1$=Co—419 and $V_2$=I.C. 225.
N in 4 doses at planting, 6th, 10th and 14th week after planting.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×7·3 m. (b) 8·2 m.×5·5 m. (v) 45 cm.× 90 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Germination and tiller counts. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 1906 Q/ha. (ii) 188·1 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

| | $N_1$ | $N_2$ | $N_3$ | Mean |
|---|---|---|---|---|
| $V_1$ | 1932 | 1958 | 1937 | 1942 |
| $V_2$ | 1825 | 1762 | 2021 | 1869 |
| Mean | 1878 | 1860 | 1979 | 1906 |

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**Crop :- Sugarcane.** **Ref :- Ms. 60(123).**

**Site :- Agri. Res. Stn., Dhadesagur.** **Type :- 'C'.**

Object :—To determine the best period of sowing and the optimum spacing required between lines.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Sannhemp.* (c) N.A. (ii) Medium black soil. (iii) As per treatments. (iv) (a) Opening furrows. (b) Planting in furrows. (c) N.A. (d) As per treatments. (e) N.A. (v) 67·2 Kg/ha. of N as A/S+26·9 Kg/ha. of $P_2O_5$ as Super. (vi) Co.—419 (early). (vii) Irrigated. (viii) N.A. (ix) 71 cm. (x) 24.12.60 and 17.1.61.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 4 dates of planting : $D_1$=1st week of December, $D_2$=1st week of January, $D_3$=1st week of February and $D_4$=1st week of March.
(2) 3 spacing between rows : $S_1=61$ cm., $S_2=91$ cm. and $S_3=122$ cm.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) and (b) 13·8 m.×7·3 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) There was borer attack in initial stage. (iii) Yield of sugarcane. (iv) (a) 1958—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(a) 873·3 Q/ha. (ii) 96·7 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

| | $D_1$ | $D_2$ | $D_3$ | $D_4$ | Mean |
|---|---|---|---|---|---|
| $S_1$ | 847·1 | 785·8 | 935·0 | 888·8 | 864·2 |
| $S_2$ | 904·1 | 874·0 | 843·3 | 849·9 | 867·8 |
| $S_3$ | 939·3 | 951·0 | 896·1 | 765·0 | 887·8 |
| Mean | 896·8 | 870·3 | 891·5 | 834·6 | 873·3 |

**Crop :- Sugarcane** (*Main* ). **Ref :- Ms. 63(26).**

**Site :- Sugarcane Res. Stn., Gangavathy.** **Type :- 'C'.**

Object :—To study the loss in yield and vigour of Cane due to continuous use of seed materials without renewing.

1. BASAL CONDITIONS :

(i) (a) *Daincha*—Sugarcane. (b) *Daincha*. (c) Nil. (ii) Black cotton soil. (iii) January, 1963. (iv) (a) Deep ploughing with tractor followed by discing. (b) Planted in furrows. (c) 24,710 setts/ha. (d) 91 cm. between furrows. (e) —. (v) Nil. (vi) Co.—419 (late). (vii) Irrigated. (viii) 3 hand weedings followed by heavy ridging. (ix) N.A. (x) 27 to 29.1.1964.

2. TREATMENTS :

6 types of seed : $T_1$=Good seed, $T_2$=Deteriorated seed, $T_3$=Good seed grown one year on the farm, $T_4$= Deteriorated seed grown one year on the farm, $T_5$=Good seed grown two years on the farm and $T_6$=Deteriorated seed grown two years on the farm.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 22·6 m.×16·5 m. (iii) 4. (iv) (a) 11·0 m.×5·5 m. (b) 9·1 m.×3·7 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Slight lodging took place in the month of November, 1964. (ii) Slight incidence of mealy bug was noticed, melathian sprayed. (iii) Tiller counts, height measurements and cane yield. (iv) (a) 1961 only. (b) No. (c) Nil. (v) Sankeswar. (vi) and (vii) Nil.

5. RESULTS :

(i) 1416·3 Q/ha. (ii) 190·5 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 1500·9 | 1342·5 | 1370·9 | 1353·6 | 1483·1 | 1447·0 |

**Crop :- Sugarcane.** **Ref :- Ms. 60(89).**

**Site :- Reg. Sugarcane Res. Stn., Gangavathi.** **Type :- 'C'.**

Object :—To find out suitable dates of planting of Sugarcane for this tract.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Sugarcane. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M.+44·8 Kg/ha. of N. (ii) Medium black cotton soil. (iii) As per treatments. (iv) (a) 2 ploughings. (b) Planting in furrow. (c) 29,653 setts/ha. (d) 91 cm. to 122 cm. between rows. (e) N.A. (v) 24·7 C.L./ha. of F.Y.M.; $P_2O_5$ and $K_2O$ applied at time of planting (quantity N.A., N applied at 336·2 Kg/ha. in 4 doses, 10, 20, 30 and 40% at planting, 8, 10 and 14 weeks after planting respectively. (vi) Co.—419 (late). (vii) Irrigated. (viii) 3 hand weedings and 1 earthing up. (ix) 51 cm. (x) 20 and 22.6.61.

2. TREATMENTS :

6 dates of planting : $D_1$=6.1.60, $D_2$=21.1.60, $D_3$=6.2.60, $D_4$=21.2.60, $D_5$=6.3.60 and $D_6$=21.3.60.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 32·9 m.×21·3 m. (iii) 6. (iv) (a) 11·0 m.×10·1 m. (b) 9·1 m.×8·2 m. (v) 91 cm. ×91 cm. (vi) Yes.

4. GENERAL :

(i) Good. Crop lodged to a greater extent in the month of Dec., 1960 and Feb., 1961. (ii) Heavy attack of stem borer in the treatment planted in the month of March, controlled by spraying with endrine. (iii) Cane yield. (iv) (a) 1959 to 60. (b) No. (c) Nil. (v) Sankeswar and Mandya. (vi) and (vii) Nil.

5. RESULTS :

(i) 868·4 Q/ha. (ii) 122·2 Q/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $D_1$ | $D_2$ | $D_3$ | $D_4$ | $D_5$ | $D_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 882·3 | 1077·8 | 838·9 | 947·6 | 722·8 | 741·2 |

C.D.=1454 Q/ha.

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**Crop :- Sugarcane.** **Ref :- Ms. 60(204), 61(210), 62(198).**

**Site :- Reg. Res. Stn., Mandya.** **Type :- 'C'.**

Object :—To study the effect of different crops on the succeeding Sugarcane crop.

1. BASAL CONDITIONS:

(i) (a) and (b) As per treatments. (c) 34 Kg/ha. each of N, $P_2O_5$ and $K_2O$. (ii) Sandy loam. (iii) 3.12.1960 ; 6.11.1961 ; 25.10.1962. (iv) (a) Ploughing. (b) Planting. (c) 30464 setts/ha. (d) 91 cm. between rows. (e) 1. (v) 84 Kg/ha. of $P_2O_5$+112 Kg/ha. of $K_2O$+24·7 C.L./ha. of F.Y.M.+336 Kg/ha. of N in 6 doses. (vi) CO—419. (vii) Irrigated. (viii) 3 harrowings. (ix) 60 cm. ; normal ; 127 cm. (x) 10.1.1962 ; 27.2.1963 ; 18.11.1963.

2. TREATMENTS :

5 previous crops : $T_1$=*Ragi*, $T_2$=Paddy, $T_3$=Tobacco, $T_4$=Cotton and $T_5$=Groundnut.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 20·1 m.×7·0 m. (b) 18·3 m.×5·5 m. (v) 91 cm.×76 cm. (vi) Yes.

4, GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1960 to 1962. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent.

5. RESULTS :

**60(204)**

(i) 1121 Q/ha. (ii) 84·2 Q/ha. (iii) Treatment differences are significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. yield | 1119 | 1075 | 1255 | 1006 | 1148 |

C.D.=129.8 Q/ha.

**61(210)**

(i) 1537 Q/ha. (ii) 326·8 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. yield | 1652 | 1602 | 1800 | 1226 | 1408 |

**62(198)**

(i) 1431 Q/ha. (ii) 149·5 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. yield | 1588 | 1359 | 1403 | 1456 | 1351 |

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**Crop :- Sugarcane (*Adsali*).** **Ref :- Ms. 64(127).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'C'.**

Object :—To study the effect of intercropping on the yield of Cane and to utilize the land in ridges during early stages.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Sandy loam. (iii) 5.8.1964 for sugarcane and 12.8.1964 for intercrops. (iv) (a) Ploughing, clad crushing and levelling. (b) Planting setts. (c) 29640 setts/ha. (3 eyebud/sett) (d) 91 cm. between rows. (e) —. (v) 25 C.L./ha. of F.Y.M. before planting, 84 Kg/ha. of $P_2O_5$ as Super, 112 Kg/ha. of $K_2O$ as Potash+336 Kg/ha. of N in four doses. (vi) CO—419 (late). (vii) Irrigated. (viii) 2 to 3 hand weedings and interculturing by bullocks and earthing up. (ix) Normal. (x) 4.12.1965.

### 2. TREATMENTS :

6 intercrops : $T_0$=Control, $T_1$=*Sunnhemp* with 34 Kg/ha. as seed rate, $T_2$=Beans with 30 cm.×90 cm. spacing and 22 Kg/ha. as seed rate, $T_3$=Raddish with 8 cm.×90 cm. spacing and 6 Kg/ha. as seed rate, $T_4$=Groundnut with 15 cm.×90 cm. spacing and 45 Kg/ha. as seed rate and $T_5$=Tobacco with 30 cm.×90 cm. spacing and 4000 seedlings.

### 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×9·1 m. (b) 7·3 m.×7·3 m. (v) 91 cm.×91 cm. (vi) Yes.

### 4. GENERAL :

(i) Good. (ii) B.H.C. was sprayed to all intercrops. (iii) Cane yield. (iv) (a) 1964—1965 (Treatments were modified in 65). (b) No. (c) Nil. (v) to (vii) Nil.

### 5. RESULTS :

(i) 3101 Q/ha. (ii) 377·5 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 3197·8 | 3229·6 | 3040·9 | 3080·2 | 3050·3 | 3007·3 |

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**Crop :- Sugarcane.** **Ref :- Ms. 65(39).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'C'.**

Object :—To study the effect of inter-cropping on the yield of Cane and to utilise the land in ridges during early stages.

### 1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Sandy loam. (iii) 9.8.65 (inter-crops on 18.8.65). (iv) (a) Ploughing, clod crushing and levelling. (b) Planting setts. (c) 29640 setts/ha (3 eyebuds/sett). (d) 91 cm. between rows. (e) Nil. (v) 336 Kg/ha. of A/S+84 Kg/ha. of $P_2O_5$+112 Kg/ha. of $K_2O$+27·4 C.L./ha. of Compost. $P_2O_5$ and $K_2O$ full dose at planting. (vi) Co. 419. (vii) Yes. (viii) Hand weeding, 2 to 3 times interculturing and earthing up. (ix) 113 cm. (x) 27 and 28.12.66.

### 2. TREATMENTS :

6 inter-crops : $T_0$=Control, $T_1$=*Sannhemp*, $T_2$=Beans, $T_3$=Raddish, $T_4$=Groundnut and $T_5$=Lucerne.

### 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 9·1 m.×9·1 m. (v) N.A. (vi) Yes.

### 4. GENERAL :

(i) Fair. (ii) Nil. (iii) Cane yield. (iv) (a) 1964 to 65 (Treatments were modified in 65). (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2000·5 Q/ha. (ii) 343·4 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1965·8 | 1889·8 | 2137·0 | 2023·0 | 1991·9 | 1995·2 |

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**Crop :- Sugarcane.** **Ref :- Ms. 61(209), 62(197).**

**Site :- Reg. Res. Stn., Mandya.** **Type :- 'C'.**

Object :—To study the possibilities of preventing lodging of Sugarcane by adopting different cultural methods.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) N.A. (ii) Sandy loam. (iii) 16.7.1961 ; 3.7.1962. (iv) (a) Ploughing. (b) Planting. (c) 30190 setts/ha. (d) 91 cm. between rows. (e) 1. (v) 12·6 C.L./ha. of Compost+84 Kg/ha. of $P_2O_5$ as Super for 1961, 24 C.L./ha. of F.Y.M.+84 Kg/ha. of $P_2O_5$+336 Kg/ha. of $K_2O$. for 1962. (vi) Co—419. (vii) Irrigated. (viii) 3 harrowings. (ix) Normal ; 127 cm. (x) 9.11.1962 ; 29.9.1963.

2. TREATMENTS :

6 cultural treatments : $T_0$=Control, $T_1$=Earthing by hand at the age of 8 months, $T_2$=Propping cane between two rows with trash and earthing, $T_3$=Propping cane with bamboo, $T_4$= Propping cane with wires and $T_5$=Planting cane in trenches 10 cm. deep.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 9.1 m.×9.1 m. (b) 7.1 m.×7.1m. (v) 100 cm.×100 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1961 to 62. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous. Treatments×years interaction is present.

5. RESULTS :

(i) 1868 Q/ha. (ii) 480·5 Q/ha. (based on 5 d.f. made up of Treatments×years interaction). (iii) Treatments differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1734 | 1941 | 2005 | 1949 | 1658 | 1918 |

| Years | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|
| 1961 | 2075 | 2651 | 2648 | 2506 | 1932 | 2412 | ** | 2371 | 210·0 |
| 1962 | 1394 | 1231 | 1362 | 1392 | 1384 | 1425 | N.S. | 1365 | 223·5 |
| Pooled | 1734 | 1941 | 2005 | 1949 | 1658 | 1918 | N.S. | 1868 | 480·5 |

**Crop :- Sugarcane (*Adsali*).** **Ref :- Ms. 61(189), 62(171).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'C'.**

Object :—To study the effect of intercropping on the yield of Cane and to utilize the land in ridges during early stage.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Ragi*; Fallow. (c) 33 Kg/ha. of N+33 Kg/ha. of $P_2O_5$+67 Kg/ha. of $K_2O$ in 1961 and N.A. in 62. (ii) Sandy loam. (iii) 1.8.61 and 3.8.62 (Cane); 4.8.61 and 3.8.62 (intercrops). (iv) (a) Ploughing, clod crushing and levelling. (b) Planting setts. (c) 29640 setts/ha. (3 eyebuds/sett). (d) 91 cm. between rows. (e) N.A. (v) 25 C.L./ha. of F.Y.M.+34 Kg/ha. of $P_2O_5$ in one dose, 136 Kg/ha. of N in 3 doses viz. 20, 40 and 40 percent at 6th, 10th and 14th week after planting. (vi) Co—419 (late). (vii) Irrigated. (viii) 2 to 3 hand weedings and earthing up in 61 and 62; interculturing by bullocks in 62. (ix) Normal. (x) 10.11.62 and 14.10.63.

2. TREATMENTS :

8 interculturings : $T_0$=Control (no inter-crop), $T_1$=*Sannhemp*, $T_2$=Beans, $T_3$=Raddish, $T_4$=Groundnut, $T_5$=Tobacco, $T_6$=Knol-Khol and $T_7$=Onion.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) 9·1 m.×9·1 m. (b) 7·3 m.×7·3 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) B.H.C. was sprayed to all inter-crops. (iii) Cane yield. (iv) (a) 1961 to 65 (not conducted in 63. Treatments changed in 1964 and 65). (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous. Treatments×years interaction is absent.

5. RESULTS :

61(189)

(i) 2341·2 Q/ha. (ii) 152·0 Q/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 2467·5 | 2689·8 | 2032·2 | 2217·2 | 2256·4 | 2185·4 | 2383·4 | 2497·4 |

C.D.=266·3 Q/ha.

62(171)

(i) 1796·4 Q/ha. (ii) 319·8 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 1944·5 | 1879·1 | 1871·6 | 1963·2 | 1655·0 | 1662·4 | 1705·4 | 1690·4 |

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**Crop :-Sugarcane.** **Ref :- Ms. 60(213), 62(214), 63(197).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'C'.**

Object :—To study the effect on change of seed material.

1. BASAL CONDITIONS :

(i) (a) *Ragi*—Sugarcane. (b) *Ragi*. (c) N.A. (ii) Sandy loam. (iii) 9.7.60; 16.7.62; 24.7.63. (iv) (a) Ploughing. (b) Planting setts. (c) 30,000 setts/ha. (approx.). (d) 91 cm. between rows. (e) 1. (v) 25 C.L./ha. of F.Y.M.+84 Kg/ha. of $P_2O_5$+336 Kg/ha. of N+112 Kg/ha. of $K_2O$. (vi) Co—419. (vii) Irrigated. (viii) Digging and earthing up in 1960 and 63; digging, passing tin harrow and blade harrow in 62. (ix) N.A. (x) 1.9.61; N.A.; 12.10.64.

2. TREATMENTS :

6 seed materials : $C_1$=Padegaon, $C_2$=Factory old, $C_3$=Ryots old, $C_4$=Farm old, $C_5$=Ugon and $C_6$=*Ratoon* crop.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 7·3 m.×9·1 m. (b) 5·5 m.×7·3 m. (v) 90 cm.×90 cm. (vi) Yes.

4. GENERAL :

(i) Fair, Satisfactory. (ii) Nil. (iii) Yield of cane. (iv) (a) 1960 to 63 (expt. for 61 N.A.). (b) No. (c) As under 5. Results. (v) and (vi) N.A. (vii) Error variances are heterogeneous, Treatments×years interaction is absent.

5. RESULTS :

**60(213)**

(i) 1377 Q/ha. (ii) 274·2 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ | $C_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 1580 | 1368 | 1430 | 1104 | 1330 | 1451 |

**62(214)**

(i) 2810 Q/ha. (ii) 475·1 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ | $C_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 3112 | 2682 | 2818 | 2627 | 2756 | 2865 |

**63(197)**

(i) 828 Q/ha. (ii) 128·5 Q/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of cane Q/ha.

| Treatment | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ | $C_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 1044 | 679 | 859 | 507 | 898 | 979 |

C.D.=189·4 Q/ha.

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**Crop :- Sugarcane** (*Main*). **Ref :- Ms. 64(22).**

**Site :- Sugarcane Res. Stn., Gangavathy.** **Type :- 'CV'.**

Object :—To assess the loss in yield of Cane by using seed materials continuously with out renewing.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Sugarcane. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M.+22·4 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$. (ii) Black cotton soil. (iii) 3.2.64. (iv) (a) Deep ploughing with tractor followed by discing. (b) Planted in furrows. (c) 24710 setts/ha. (d) 91 cm. between furrows. (e) Nil. (v) 24·7 C.L./ha. of F.Y.M. +84·1 Kg/ha. of $P_2O_5$+112·1 Kg/ha. of $K_2O$+336·2 Kg/ha. of N as A/S in 4 doses of 10, 20, 30 and 40% at planting, 6, 10 and 14 weeks after planting respectively. (vi) Co—419 (late). (vii) Irrigated. (viii) Heavy earthing up operation by working with ridger. (ix) 91 cm. (x) 6.3.65.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : $V_1$=Good seed and $V_2$=Deteriorated seed.

(2) 4 types of seed materials : $T_1$=Unused seed, $T_2$=Grown 1 year seed on the farm, $T_3$=Grown 2 years on the farm and $T_4$=Grown 3 years on the farm.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) 9·1 m.×732·2 m. (iii) 3. (iv) (a) 9 1 m.×9·1 m. (b) 7·3 m.×7·3 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Crop lodged in the month of Sept. (ii) Nil. (iii) Tiller counts and yield of cane. (iv) (a) 1964 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1207·6 Q/ha. (ii) 116·6 Q/ha. (iii) V effect is highly significant. (iv) Av. yield of sugarcane in Q/ha.

| | $T_1$ | $T_2$ | $T_3$ | $T_4$ | Mean |
|---|---|---|---|---|---|
| $V_1$ | 1319·5 | 12·2·9 | 1298·8 | 1294·6 | 1279·0 |
| $V_2$ | 1034·6 | 1118·9 | 1184·6 | 1207·4 | 1236·4 |
| Mean | 1177·0 | 1160·9 | 1241·7 | 1251·0 | 1207·6 |

C.D. for V marginal means=102·1 Q/ha.

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**Crop :- Sugarcane.** **Ref :- Ms. 60(290).**

**Site :- Agri. Res. Stn., Alnawar.** **Type :- 'CM'.**

Object :—To find out the effect of N, P and K and trace elements on the deteriorated seeds.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—Paddy. (b) Paddy. (c) N.A. (ii) Medium black. (iii) 14.2.1960. (iv) (a) Ploughing, clod crushing, opening furrows and ridges. (b) Planting setts. (c) 24710 setts/ha. (d) 91 cm. between lines. (e) Nil. (v) 168 Kg/ha. of N as A/S and cake in ratio 1 : 1 to all plots. (vi) Co—419. (vii) Irrigated. (viii) Loosening the soil by hand tool and light earthing up. (ix) 89 cm. (x) N.A.

2. TREATMENTS :

8 seed types and manurial treatments : $T_1$=Second year seed+24·7 C.L./ha. of F.Y.M., $T_2$=Deteriorated seed+24·7 C.L./ha. of F.Y.M., $T_3$=$T_2$+168 Kg/ha. of $P_2O_5$, $T_4$=$T_2$+22·4 Kg/ha. $K_2O$, $T_5$=$T_2$+168 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$, $T_6$=Deteriorated seed+minor elements, $T_7$=$T_6$+168 Kg/ha. of $P_2O_5$+224 Kg/ha. of $K_2O$, $T_8$=$T_6$+10 Q/ha. of lime.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 2. (iv) (a) 9·1 m.×4·6 m. (b) 7·3 m.×2·7 m. (v) 90 cm.×90 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Cane yield. (iv) (a) 1957—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 554·4 Q/ha. (ii) 127·0 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 624.3 | 436·3 | 661·4 | 503·6 | 612·7 | 438·6 | 705·5 | 452·5 |

**Crop :- Sugarcane** (*Adsali*). **Ref :- Ms. 63(30).**

**Site :- Sugarcane Res. Stn., Gangavathy.** **Type :- 'CM'.**

Object :—To study the possibilities of obtaining maximum Sugar due to different dates of harvest of Cane.

1. BASAL CONDITIONS :

(i) (a) G.M., Sugarcane. (b) *Sannhemp* (c) Nil. (ii) (a) Black cotton soil. (iii) 4.8.1963. (iv) (a) Deep ploughing with tractor followed by discing. (b) Planted in furrows. (c) 24710 setts/ha. (d) 91 cm. between rows. (e) Nil. (v) Nil. (vi) Co. 419 (late). (vii) Irrigated. (viii) 2 hand weedings and earthing up. (ix) N.A. (x) As per treatments.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : $N_1$=168·1, $N_2$=336.2 and $N_3$=504·4 Kg.

(2) 2 dates of harvest : $D_1$=9.12.1964 and $D_2$=4.2.1965.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) 32·9 m.×12.8 m. (iii) 4. (iv) (a) 11·0 m.×6·4 m. (b) 9.1 m.×4·6 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Lodged to some extent. (ii) Crop was attacked by top shoot borer, controlled by spraying Endrine. (iii) Tiller counts, height measurements, girth and no. of internodes. (iv) 1963 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1162·7 Q/ha. (ii) 83·8 Q/ha. (iii) Main effects of N and D are highly significant. (iv) Av. yield of sugarcane in Q/ha.

| | $N_1$ | $N_2$ | $N_3$ | Mean |
|---|---|---|---|---|
| $D_1$ | 977·0 | 1196·0 | 1145·1 | 1106·0 |
| $D_2$ | 1193·5 | 1283·2 | 1181·7 | 1219·5 |
| Mean | 1085·2 | 1239·6 | 1163·4 | 1162·7 |

C.D. for N marginal means=89.3 Q/ha.

C.D. for D marginal means=72.9 Q/ha.

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**Crop :- Sugarcane** (*Main season*). **Ref :- Ms. 63(28), 64(20).**

**Site :- Sugarcane Res. Stn., Gangavathy.** **Type :- 'CM'.**

Object :—To find out the suitable dose of N, optimum spacing and seed rate for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Dhaincha*—Sugarcane in 1963 and *Jowar*—Sugarcane in 1964. (b) *Dhaincha* in 1963 and *Jowar* in 1964. (c) Nil (1963); 22·4 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$+12·4 C.L./ha. of F.Y.M. (1964). (ii) Black cotton soil. (iii) 27, 28.1.63; 11.2.1964. (iv) (a) Deep ploughing with tractor followed by discing (b) Planted in furrows. (c) and (d) As per treatments. (e) Nil. (v) 24.7 C.L./ha. of F.Y.M.+84.1 Kg/ha. of $P_2O_5$+112·1 Kg/ha. of $K_2O$. (vi) Co.—419(late). (vii) Irrigated. (viii) 3 hand weedings followed by heavy ridging. (ix) N.A. (x) 1, 8.3.1964; 5.3.1965.

2. TREATMENTS :

**Main-plot treatments :**

2 levels of N :$N_1$=224·2 and $N_2$=336.2 Kg/ha.

**Sub-plot treatments :**

2 spacings :$S_1$=76 and $S_2$=107 cms.

**Sub-sub-plot treatments :**

2 types of setts : $T_1$=24710 and $T_2$=29653 setts/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication; 2 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) 11.0 m. × 10.7 m. (b) 8·4 m. × 9·1 m. (v) 130 cm. × 76 cm. (vi) Yes.

4. GENERAL :

(i) Slight lodging noticed in the month of Dec., 1963 ; Satisfactory in 1964. (ii) Nil. (iii) Tillers counts, height measurement, no. of internodes and cane yield. (iv) (a) 1963 to 66. (b) No. (c) Nil. (v) and (vi) Nil. (vii) All the error variances are homogeneous. Main, sub and sub-sub-plot treatments × year inter-actions are absent.

5. RESULTS :

(i) 885 Q/ha. (ii) (a) 175·2 Q/ha. [based on 7 d.f. made up of pooled error and treatments × years inter-action]. (b) 200·2 Q/ha. (based on 14 d.f. made up of pooled error and S × years and N × S × years inter-action). (c) 173.2 Q/ha. (based on 27 d.f. made up of pooled error and T × years, N × T × years, and S × T × years interaction. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

| | $N_1$ | $N_2$ | $T_1$ | $T_2$ | Mean |
|---|---|---|---|---|---|
| $S_1$ | 750 | 906 | 846 | 810 | 828 |
| $S_2$ | 950 | 934 | 945 | 940 | 942 |
| Mean | 850 | 920 | 895 | 875 | 885 |
| $T_1$ | 878 | 912 | | | |
| $T_2$ | 822 | 928 | | | |

| Years | $N_1$ | $N_2$ | S.E./plot | Sig. | $S_1$ | $S_2$ | S.E ./plot | Sig. | $T_1$ | $T_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1963 | 1111 | 1075 | 159·4 | N.S. | 1040 | 1146 | 129·8 | N.S. | 1102 | 1084 | N.S. | 1093 | 212·7 |
| 1964 | 588 | 766 | 214·2 | N.S. | 616 | 738 | 213·2 | N.S. | 688 | 666 | N.S. | 677 | 145·8 |
| Pooled | 850 | 920 | 175·2 | N.S. | 828 | 942 | 185·1 | N.S. | 895 | 875 | N.S. | 885 | 173·3 |

**Crop :- Sugarcane.** **Ref :- Ms. 60(88), 62(42).**

**Site :- Reg. Sugarcane Res. Stn., Gangavathy.** **Type :- 'CM'.**

Object :—To find out the optimum spacing and dose of N for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Jowar*, Sugarcane in 1960 ; *Sannhemp*—Sugarcane in 1962. (b) *Jowar* in 1960 and *Sannhemp* in 1962. (c) 12·4 C.L./ha. of F.Y.M.+22·4 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of N in 1960; Nil in 1962. (ii) Medium block cotton soil. (iii) 2 and 6.3.1960; 1 and 3.8.1962. (iv) (a) 2 ploughings in 1960; Deep ploughings with tractor followed by disc harrowing. (b) Planting in furrows. (c) 29652 setts/ha. for 91 cm. spacing and 22240 setts for 122 cm. spacing. (d) As per treatments. (e) Nil. (v) 24.7 C.L./ha. of F.Y.M.+$P_2O_5$ and $K_2O$ (dosage N.A.) applied at planting by broadcasting. (vi) Co.--419 (late). (vii) Irrigated. (viii) 3 hand weedings and earthing up. (ix) 51 cm.; 62 cm. (x) 18 and 22.6.1961; 10 and 18.10.1963.

2. TREATMENTS :

**Main-plot treatments :**

3 levels of N as A/S : $N_1$=168·1, $N_2$=252·2 and $N_3$=336.2 Kg/ha.

**Sub-plot treatments :**

2 spacings between rows :$S_1$=91 and $S_2$=122 cm.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 14·0 m. ×11·0 m. (b) 12.2 m.×7.3 m. (v) Yes. (vi) Yes.

4. GENERAL :

(i) Satisfactory ; crop lodged to a greater extent in the month of Feb., 1961. (ii) Heavy attack of stem-borer, endrine sprayed in 1960. (iii) Tiller counts, height measurements and yield of sugarcane. (iv) (a) 1959 to 62 (Expt.for 61—N.A.). (b) No. (c) Nil. (v) and (vi) Nil. (vii) Sub-plot error variances are heterogeneous.

5. RESULTS :

**60(88)**

(i) 846.2 Q/ha. (ii) (a) 109·6. Q/ha. (b) 88·2 Q/ha. (iii) S effect is significant. (iv) Av. yield of sugarcane in Q/ha.

| | $N_1$ | $N_2$ | $N_3$ | Mean |
|---|---|---|---|---|
| $S_1$ | 820·2 | 911·4 | 923·0 | 884·9 |
| $S_2$ | 752·5 | 827·8 | 842·3 | 807·5 |
| Mean | 786·4 | 869·6 | 882·6 | 846·2 |

C.D. for S marginal means=88·6 Q/ha.

**62(42)**

(i) 1487·9 Q/ha. (ii) (a) 179·0 Q/ha. (b) 142·5 Q/ha. (iii) Main effect of N is significant. Main effect of S is highly significant. (iv) Av. yield of sugarcane in Q/ha.

| | $N_1$ | $N_2$ | $N_3$ | Mean |
|---|---|---|---|---|
| $S_1$ | 1469·0 | 1583·7 | 1644·8 | 1565·8 |
| $S_2$ | 1258·2 | 1489·7 | 1482·1 | 1410·0 |
| Mean | 1363·6 | 1536·7 | 1563·4 | 1487·9 |

C.D. for N marginal means=230·3 Q/ha.
C.D. for S marginal means=143·1 Q/ha.

**Crop :- Sugarcane.** **Ref :- Ms. 62(205), 63(194), 64(153), 65(41).**

**Site :- Reg. Res. Stn., Mandya.** **Type :- 'CM'.**

Object :—To study the combined effect of spacing, seed-rate and graded levels of N on yield and quality of Cane.

## 1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 28.7.62, 7.7.63., 20.7.64., 18.7.65. (iv) (a) Ploughing, clod crushing and levellings. (b) Planting setts. (c) and (d) As per treatments. (e) N.A. (v) 28 C.L./ha. of F.Y.M.+84 Kg/ha. of $P_2O_5$+112 Kg/ha. of $K_2O$. (vi) Co.—419. (vii) Irrigated. (vii) Passing blade harrow and tin harrow 3 times, weeding and inter-culturing. (ix) 127 cm ; Normal ; Normal ; 116 cm. (x) 2.10.63 ; 15.10.64 ; 21.11.65 ; 2.12.66.

## 2. TREATMENTS :

**Main-plot treatments :**

2 levels of N : $N_1$=224 and $N_2$=336 Kg/ha.

**Sub-plot treatments :**

2 spacings : $S_1$=76 and $S_2$=91 cm.

**Sub-sub-plot treatments :**

2 seed rates : $R_1$=24710 and $R_2$=29652 setts/ha.

N applied in 4 split-doses.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 2 sub-plots/main-plot ; 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 4 for 1962 to 64 and 3 for 1965 year. (iv) (a) N.A. (b) 9·1 m.×7·5 m. for 62 and 63 ; 11·0 m.×9.1 m, for 64 and 65. (v) and (vi) Yes.

## 4. GENFRAL :

(i) Fair. (ii) Nil. (iii) Yield of cane. (iv) (a) 1962-65. (b) No. (c) Nil. (v) N.A. (vi) Nil. (viii) Sub-sub-plot error variances are heterogeneous.

## 5. RESULTS :

**62(205)**

(i) 912 Q/ha. (ii) (a) 200·5 Q/ha. (b) 121·9 Q/ha. (c) 84·2 Q/ha. Inter-action N×R is significant. (iv) Av. yield of sugarcane in Q/ha.

| | $N_1$ | $N_2$ | $S_1$ | $S_2$ | Mean |
|---|---|---|---|---|---|
| $R_1$ | 838 | 938 | 905 | 871 | 888 |
| $R_2$ | 957 | 913 | 989 | 881 | 935 |
| Mean | 897 | 925 | 947 | 876 | 912 |
| $S_1$ | 931 | 963 | | | |
| $S_2$ | 864 | 888 | | | |

C.D. for R means at the same level of N=91·9 Q/ha.
C.D. for N means at the same level of R=233·2 Q/ha.

**63(194)**

(i) 1979 Q/ha. (ii) (a) 304·1 Q/ha. (b) 144·3 Q/ha. (c) 191·2 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

|  | $N_1$ | $N_2$ | $S_1$ | $S_2$ | Mean |
|---|---|---|---|---|---|
| $R_1$ | 1871 | 1992 | 1919 | 1944 | 1931 |
| $R_2$ | 2099 | 1955 | 2041 | 2013 | 2027 |
| Mean | 1985 | 1973 | 1980 | 1978 | 1979 |
| $S_1$ | 2004 | 1956 |  |  |  |
| $S_2$ | 1966 | 1991 |  |  |  |

64(153)

(i) 1884 Q/ha. (ii) (a) 202·7 Q/ha. (b) 88·5 Q/ha. (c) 175·4 Q/ha. (iii) Interaction N×S is significant. (iv) Av. yield of sugarcane in Q/ha.

|  | $N_1$ | $N_2$ | $S_1$ | $S_2$ | Mean |
|---|---|---|---|---|---|
| $R_1$ | 1738 | 2090 | 1872 | 1956 | 1914 |
| $R_2$ | 1693 | 2013 | 1809 | 1897 | 1853 |
| Mean | 1715 | 2052 | 1841 | 1927 | 1884 |
| $S_1$ | 1730 | 1951 |  |  |  |
| $S_2$ | 1700 | 2153 |  |  |  |

C.D. for S means at the same level of N=108·2 Q/ha.
C.D. for N means at the same level of S=239·6 Q/ha.

65(41)

(i) 1853 Q/ha. (ii) (a) 432·5 Q/ha. (b) 238·8 Q/ha. (c) 286·0 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

|  | $N_1$ | $N_2$ | $S_1$ | $S_2$ | Mean |
|---|---|---|---|---|---|
| $R_1$ | 1898 | 1799 | 1839 | 1858 | 1849 |
| $R_2$ | 1994 | 1720 | 1841 | 1874 | 1857 |
| Mean | 1946 | 1760 | 1840 | 1866 | 1853 |
| $S_1$ | 1898 | 1782 |  |  |  |
| $S_2$ | 1994 | 1737 |  |  |  |

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**Crop :- Sugarcane.** **Ref :- Ms. 60(207), 61(212).**

**Site :- Reg. Res. Stn., Mandya.** **Type :- 'CM'.**

Object :—To study the effect of different levels of N and spacings on the yield of Cane.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Sandy loam. (iii) 20.7.60; 23.9.61. (iv) (a) Ploughing. (b) Planting. (c) Nil. (d) As per treatments. (e) N.A. (v) 28 C.L./ha. of F.Y.M.+84 Kg/ha. of $P_2O_5$. (vi) Co—419. (vii) Irrigated. (viii) Passing blade and tin harrow 3 times; weeding and interculturing. (ix) 60 cm.; 110 cm. (x) 30.8.61; 24.1.63.

2. TREATMENTS :

**Main-plot treatments :**

3 levels of N : $N_1$=168, $N_2$=336 and $N_3$=504 Kg/ha.

**Sub-plot treatments :**

2 spacings between rows : $S_1$=91 and $S_2$=122 cm.

N at 10, 20, 30 and 40% applied at planting, 6, 10 and 14 weeks after planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 11·0 m.× 9·1 m. (b) 7·3 m.×7·3 m. (v) 182 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1958 to 61. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Sub-plot error variances are heterogeneous.

5. RESULTS :

60(207)

(i) 953 Q/ha. (ii) (a) 221·8 Q/ha. (b) 179·2 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

|  | $N_1$ | $N_2$ | $N_3$ | Mean |
|---|---|---|---|---|
| $S_1$ | 984 | 870 | 1081 | 978 |
| $S_2$ | 905 | 976 | 902 | 928 |
| Mean | 944 | 923 | 992 | 953 |

61(212)

(i) 1948 Q/ha. (ii) (a) 338·0 Q/ha. (b) 565·5 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha.

|  | $N_1$ | $N_2$ | $N_3$ | Mean |
|---|---|---|---|---|
| $S_1$ | 2150 | 1584 | 1878 | 1871 |
| $S_2$ | 1862 | 2208 | 2009 | 2026 |
| Mean | 2006 | 1896 | 1944 | 1948 |

* * *

**Crop :- Sugarcane** (*Adsali*). **Ref :- Ms. 61(192).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'CM'.**

Object :—To study the effect of different seed material (obtained from different sources) in combination with fertilizer on the yield and quality of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Ragi*. (c) 25 C.L./ha. of F.Y.M. (ii) (a) Sandy loam. (b) N.A. (iii) 19.8.61. (iv) (a) Ploughing, clod crushing and levelling. (b) Planting setts. (c) 29640 setts/ha. (d) 91 cm. between rows. (e) 3 eyebuds/sett. (v) 25 C.L./ha. of F.Y.M. before planting. (vi) Co—419 (late). (vii) Irrigated. (viii) 2 to 3 hand weedings and interculturing and earthing up. (ix) Normal. (x) 26.11.62.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 6 types of seed material : $S_1$=Padegaon, $S_2$=Factory old, $S_3$=Local ryots, $S_4$=Farm old, $S_5$=Ugar and $S_6$=*Ratoon.*

(2) 2 levels of manures : $L_1$=336 Kg/ha. of N+84 Kg/ha. of $P_2O_5$+112 Kg/ha. of $K_2O$ as Mur. Pot. and $L_2$=252 Kg/ha. of N+56 Kg/ha. of $P_2O_5$.

N applied as A/S in 4 equal doses, $P_2O_5$ applied as Super at planting. $K_2O$ applied as Mur. Pot. at planting.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) 9·1 m.×7·3 m. (b) 7·3 m.×5·5 m. (v) 91 cm.× 91 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) 2—4 D weedicide sprayed 2 to 3 days after planting. (iii) Tiller count, height, proportion of cane and yield. (iv) (a) 1961—64 (Treatments modified in 63). (b) No. (c) Nil. (v) and (vi) Nil. (vii) Expt. for '62—N.A.

5. RESULTS ;

(i) 1723·4 Q/ha. (ii) 170·1 Q/ha. (iii) Main effect of S is highly significant. (iv) Av. yield of cane in Q/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | Mean |
|---|---|---|---|---|---|---|---|
| $L_1$ | 1960·9 | 1651·3 | 1872·9 | 1312·5 | 1976·7 | 1807·3 | 1763·6 |
| $L_2$ | 1878·7 | 1602·3 | 1780·9 | 1371·5 | 1786·6 | 1678·7 | 1683·1 |
| Mean | 1919·8 | 1626·8 | 1826·9 | 1342·0 | 1881·6 | 1743·0 | 1723·4 |

C.D. for S marginal means=203·6 Q/ha.

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**Crop :- Sugarcane** (*Adsali*). **Ref :- Ms. 63(169), 64(129).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'CM'.**

Object :—To study the effect of different seed materials, obtained from different sources in combination with fertilizers on the yield and quality of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Ragi*—Sugarcane. (c) 25 C.L./ha. of F.Y.M. (ii) Sandy loam. (iii) 24.7.63; 17.6.64. (iv) (a) Ploughing, clod crushing and levelling. (b) Planting setts. (c) 29640 setts/ha. (3 eyebuds/sett). (d) 91 cm. between rows. (e) Nil. (v) 25 C.L./ha. of F.Y.M. before planting. (vi) Co—419 (late). (vii) Irrigated. (viii) 2 to 3 hand weedings, interculturing and earthing up. (ix) Normal. (x) 12.10.64; 10.10.65.

2. TREATMENTS :

**Main-plot treatments :**

6 types of seed-materials : $S_1$=Padegaon, $S_2$=Factory old, $S_3$=Local ryots, $S_4$=Farm old, $S_5$=Ugar and $S_6$=*Ratoon* crop.

**Sub-plot treatments :**

4 manurial treatments : $M_1$=252 Kg/ha. of N in 4 doses viz. 10, 20, 30 and 40% of N applied at planting, 6th, 10th and 14th week of planting respectively, $M_2$=112 Kg/ha. of Super+112 Kg/ha. of A/S at 6th week after planting and 244 Kg/ha. of A/S+56 Kg/ha. of Super+56 Kg/ha. of G.N.C. at final earthing up, $M_3$= 252 Kg/ha. of N in 4 doses as $M_1$+112 Kg/ha. of $K_2O$ as Pot. Sul. at planting and $M_4$=336 Kg/ha. of N in 4 doses as in $M_1$+84 Kg/ha. of $P_2O_5$ +112 Kg/ha. of $K_2O$.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 9·1 m.× 7·3 m. (b) 7·3 m.×5·5 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) 2—4 D weedicide sprayed 2 to 3 days after planting. (iii) Tiller count, height and cane yield. (iv) (a) 1961 to 64 (Treatments modified in '63). (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Sub-plot error variances are heterogeneous.

5. RESULTS :

63(169)

(i) 1417·5 Q/ha. (ii) (a) 211·4 Q/ha. (b) 135·9 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | Mean |
|---|---|---|---|---|---|---|---|
| $M_1$ | 1586·9 | 1074·1 | 1565·4 | 1036·5 | 1685·6 | 1171·0 | 1353·2 |
| $M_2$ | 1586·9 | 1323·3 | 1452·4 | 1787·8 | 1689·2 | 1752·0 | 1598·6 |
| $M_3$ | 1850·6 | 1038·3 | 1059·8 | 871·5 | 1312·6 | 1549·3 | 1280·4 |
| $M_4$ | 1414·8 | 1409·4 | 1682·0 | 1321·6 | 1120·8 | 1678·4 | 1437·8 |
| Mean | 1609·8 | 1211·3 | 1439·9 | 1254·4 | 1452·0 | 1537·7 | 1417·5 |

64(129)

(i) 1265·8 Q/ha. (ii) (a) 278·9 Q/ha. (b) 298·9 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | Mean |
|---|---|---|---|---|---|---|---|
| $M_1$ | 1259·1 | 889·2 | 1454·4 | 901·8 | 937.7 | 1607·1 | 1174·9 |
| $M_2$ | 1402·6 | 1026·0 | 1358·1 | 963·6 | 1363·4 | 1449·7 | 1260·6 |
| $M_3$ | 1197·4 | 1222·6 | 1001·5 | 1082·5 | 1333·5 | 1502 2 | 1223·3 |
| $M_4$ | 1765·2 | 1303·6 | 1118·3 | 1293·0 | 1632·4 | 1312 9 | 1404·2 |
| Mean | 1406·1 | 1110·4 | 1233·1 | 1060·2 | 1316·8 | 1468·0 | 1265·8 |

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**Crop :- Sugarcane.** **Ref :- Ms. 64(209), 65(91).**

**Site :- Agri. Res. Stn., Sankeswar.** **Type :- 'CM'.**

Object:—To find out optimum spacing and seed rate with optimum N to get economic return.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Medium black. (iii) 11.2.64; 25.1.65. (iv) (a) Ploughing and harrowing. (b) Wet method (planted setts). (c) and (d) As per treatments. (e) Nil. (v) 24·7 C.L./ha. of F.Y.M.+56 Kg/ha. of $P_2O_5$+84 Kg/ha. of $K_2O$ all applied at the time of planting. (vi) Co—419. (vii) Irrigated. (viii) 2 earthing up and 2 weedings. (ix) 77 cm.; N.A. (x) 21.2.65; 4.3.66.

2. TREATMENTS :

**Main-plot treatments :**

2 levels of N : $N_1$=224 and $N_2$=336 Kg/ha. of N.

**Sub-plot treatments :**

2 spacings : $S_1$=76 and $S_2$=107 cm.

**Sub-sub-plot treatments :**

2 seed rates : $R_1$=24710 and $R_2$=29652 setts/ha.

10, 20, 30 and 40% of N applied at the time of planting, after 6th week, 10th week and 14th week of planting respectively.

3. DESIGN :

(i) Split-split-plot. (ii) (a) 2 main-plots/replication, 2 sub-plots/main-plot ; 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) 13·7 m.×8·5 m. (b) 10·7 m.×5·5 m. (v) 1·5 m. alround. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Cane yield. (iv) (a) 1964—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

64(209)

(i) 1176·2 Q/ha. (ii) (a) 67·1 Q/ha. (b) 77·2 Q/ha. (c) 146·1 Q/ha. (iii) S effect alone is significant. (iv) Av. yield of cane in Q/ha.

| | $S_1$ | $S_2$ | $R_1$ | $R_2$ | Mean |
|---|---|---|---|---|---|
| $N_1$ | 1211·5 | 1077·9 | 1159·3 | 1130·0 | 1144·7 |
| $N_2$ | 1239·6 | 1175 6 | 1129·7 | 1285·5 | 1207·6 |
| Mean | 1225·6 | 1126·7 | 1144·5 | 1207 8 | 1176·2 |
| $R_1$ | 1188·1 | 1101·0 | | | |
| $R_2$ | 1263 0 | 1152·5 | | | |

C.D. for S marginal means=87·5 Kg/ha.

65(91)

(i) 788·8 Q/ha. (ii) (a) 126·5 Q/ha. (b) 120·2 Q/ha. (c) 189·6 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

| | $S_1$ | $S_2$ | $R_1$ | $R_2$ | Mean |
|---|---|---|---|---|---|
| $N_1$ | 756·7 | 738·4 | 742·4 | 752·7 | 747·6 |
| $N_2$ | 822·4 | 837·5 | 829·0 | 831·0 | 830·0 |
| Mean | 789·6 | 788·0 | 785·7 | 791·8 | 788·8 |
| $R_1$ | 741·3 | 830·1 | | | |
| $R_2$ | 837·8 | 745·8 | | | |

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**Crop :- Sugarcane.** **Ref :- Ms. 62(104).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'I'.**

Object :—To find out the optimum interval and intensity of irrigation for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Maize.* (c) Nil. (ii) (a) Medium black mixed shallow soil. (iii) 12.1.62. (iv) (a) Ploughing and clod crushing, harrowing, opening furrows and channels. (b) Planted in furrows. (c) to (e) N.A. (v) 49·4 C.L./ha. of F.Y.M.+224·2 Kg/ha. of N+112·1 Kg/ha. of $P_2O_5$+112·1 Kg/ha. of $K_2O$. (vi) Co.—419. (vii) As per treatments. (viii) 1 interculturing, 4 weedings and earthing up. (ix) 58 cm. (x) 12.2.63.

2. TREATMENTS :

All combinations of (1) and (2)

(i) 4 no. of irrigations : $I_1$=34 irrigations each at 10 days interval, $I_2$=30 irrigations each at 12 days interval, $I_3$=23 irrigations each at 15 days interval and $I_4$=26 irrigations each at 15 days interval.

(2) 2 intensities of irrigations : $L_0$=0 and $L_1$=3/4 judgement.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 12.2 m.×8.5 m. (b) 9.8 m.×6.4 m. (v) 120 cm.×100 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Stem borer controlled by mechanical means and spraying with Folidol. (iii) Yield of cane. (iv) (a) 1962—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 984.0 Q/ha. (ii) 74.1 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of Sugarcane in Q/ha.

| | $I_1$ | $I_2$ | $I_3$ | $I_4$ | Mean |
|---|---|---|---|---|---|
| $L_0$ | 1026·7 | 958·7 | 982·3 | 931·4 | 974·8 |
| $L_1$ | 973·9 | 1038·4 | 1005·5 | 955·1 | 993·2 |
| Mean | 1000·3 | 998·6 | 993·9 | 943·2 | 984·0 |

* * *

**Crop :- Sugarcane.** **Ref :- Ms. 63(23).**

**Site :- Agri. Res. Stn. Sirugappa.** **Type :- 'I'.**

Object :—To study the effect of different periods of irrigation on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) 12·4 C.L./ha. of F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (ii) Deep black. (iii) Planting on 7, 8.2.1963. (iv) (a) 2 ploughings. (b) planted in furrows. (c) 24710 setts/ha. (d) 91 cm. between rows. (e) N.A. (v) 24·7 C.L./ha. of F.Y.M.+84·1 Kg/ha. of $P_2O_5$+112.1 Kg/ha. of $K_2O$+336·2 Kg/ha. of N in 4 split doses of 10%, 20%, 30% and 40% at planting, 6, 10 and 14 weeks after planting respectively. (vi) Co.—419 (Late). (vii) As per treatments. (viii) 2 hand weedings. (ix) 76 cm. (x) 10.2.64.

2. TREATMENTS :

(i) 6 irrigations : $T_1$=March 10th to April 10th, $T_2$=April 10th to May 10th, $T_3$=May 10th to June 10th. $T_4$=April 10th to 25th and Dec. 10th to 25th, $T_5$=Dec. 10th to Jan. 10th. and $T_6$=Normal irrigation practices.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 11·0 m.×8·5 m. (b) 7·3 m.×6·7 m. (v) 183 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Attack of stem borer. Malathion sprayed thrice. (iii) Yield data and stand count. (iv) (a) 1963 only. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Expt. conducted by Sugarcane Res. Stn., Gangavathy.

5. RESULTS :

(i) 751·0 Q/ha. (ii) 93·6 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 733·2 | 797·6 | 748·4 | 794·7 | 769·2 | 663·0 |

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**Crop :- Sugarcane.** **Ref :- Ms. 61(259), 62(260).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'I'.**

Object !—To find out the effect of break of one month in irrigation on Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Sugarcane—Paddy. (b) Paddy. (c) N.A. (ii) Medium black soil. (iii) 10.2.61, 24.1.1962. (iv) (a) Ploughing and opening furrows. (b) Wet method of chain planting. (c) 29652 setts/ha. (d) 91 cm. between rows. (e) Nil. (v) 24.7 C.L./ha. of F.Y.M.+56 Kg/ha. of $P_2O_5$+112 Kg/ha. of $K_2O$+336 Kg/ha. of N. (vi) Co.—419 (Mid. late). (vii) Irrigated. (viii) Harrowing and light earthing up. (ix) 74 cm., 53 cm. (x) 26.1.62 and 8.3.62 ; 27.3.63.

2. TREATMENTS :

6 irrigational treatments :

$T_1$=Not irrigated between April 10th and May 10th, $T_2$=Not irrigated between April 10th to 25th and Dec. 10th to 25th, $T_3$=Not irrigated between Dec. 10th to Jan. 10, $T_4$=Not irrigated between March 10th to April 10th, $T_5$=Not irrigated between May 10th to June 10th and $T_6$=Normal irrigation practices (Irrigation once in 8 days throughout the crop season).

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 66·0 m.×33·0 m. (iii) 4. (iv) (a) 11·3 m.×8·2 m. ; 10·1 m.×9·1 m. (b) 5·8 m. ×4·6 m. ; 6·4 m.×5·5 m. (v) 175 cm.×183 cm.; 185 cm.×182 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1961-62. (b) No. (c) As under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous. Treatments×years interaction is absent.

5. RESULTS :

(i) 1410 Q/ha. (ii) 204·0 Q/ha. (with 30 d.f. made up of pooled error). (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 1306 | 1441 | 1473 | 1401 | 1418 | 1418 |

| Years | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|
| 1961 | 1116 | 1223 | 1250 | 1234 | 1290 | 1138 | N.S. | 1209 | 232·0 |
| 1962 | 1496 | 1659 | 1696 | 1568 | 1545 | 1699 | N.S. | 1610 | 171·4 |
| Pooled | 1306 | 1441 | 1473 | 1401 | 1418 | 1418 | N.S. | 1410 | 197·0 |

**Crop :- Sugarcane.** **Ref :- Ms. 61(104), 62(103).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'IM'.**

Object :—To find out water and manurial requirement of Sugarcane.

### 1. BASAL CONDITIONS :

(i) (a) Maize, *Sannhemp*, Sugarcane in 1961 ; Sugarcane, *Sannhemp*, G.M. in 1962. (b) Maize and *Sannhemp* in 1961 ; *Sannhemp*, G.M. in 1962. (c) 12·4 C.L./ha. of F.Y.M. in 1961 ; N.A. in 1962. (ii) Black mixed soil. (iii) 20.1.1961 ; 19.1.1962. (iv) (a) Ploughing and harrowing, opening furrows. (b) Planted in furrows. (c) to (e) N.A. (v) 39·5 C.L./ha. of F.Y.M. in 1961 ; 49.8 C.L./ha. of F.Y.M. (vi) Co.—419. (vii) Irrigated. (viii) 1 interculturing, 3 to 4 weedings and earthing up. (ix) 52 cm. ; 58 cm. (x) 29.1.1962 to 3.2.1962 ; 28.1.1963 to 2.2.1963.

### 2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 manurial treatments : $M_1$=224.2 Kg/ha. of N as A/S and G.N.C. in the ratio of 1 : 2, $M_2$=224.2 Kg/ha. of N as A/S in 6 doses, $M_3=M_2+112·1$ Kg/ha. of $P_2O_5$ at planting and $M_4=M_3+112·1$ Kg/ha. of $P_2O_5+11·2$ Kg/ha. of $K_2O$ at planting.

(2) 2 levels of irrigations : $I_0$=0 and $I_1$=3/4 judgement.

### 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) 97·5 m.×7·5 m. (iii) 4. (iv) (a) 12·2 m.×7·5 m. (b) 9·8 m.×5·3 m. (v) and (vi) Yes.

### 4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of cane. (iv) (a) 1961-62. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous. Treatments×years interaction is absent.

### 5. RESULTS :

(i) 991·0 Q/ha. (ii) 103·0 Q/ha. (based on 49 d.f. made up of pooled error and Treatments×years interaction. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $I_0$ | 946·8 | 988·0 | 951·5 | 1027·0 | 978·3 |
| $I_1$ | 940·6 | 1005·0 | 1029·3 | 1039·5 | 1003·6 |
| Mean | 943·7 | 996·5 | 990·4 | 1033·2 | 991·0 |

| Years | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Sig. | $I_0$ | $I_1$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1961 | 909·4 | 912·5 | 925·0 | 981·0 | N.S. | 921·0 | 942·9 | N.S. | 932·0 | 79·7 |
| 1962 | 978·1 | 1080·5 | 1055·7 | 1085·5 | N.S. | 1035·7 | 1064·3 | N.S. | 1050·0 | 124·9 |
| Pooled | 943·7 | 996·5 | 990·4 | 1033·2 | N.S. | 978·3 | 1003·6 | N.S. | 991·0 | 103·0 |

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**Crop :- Sugarcane.** **Ref :- Ms. 63(244).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'IM'.**

Object :—To find out water and manurial requirement of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) *Sannhemp*—Sugarcane. (b) *Sannhemp*. (c) Nil. (ii) Black and alkaline patches. (iii) 5.2.63. (iv) (a) Ploughing, harrowing and opening furrows. (b) to (e) N.A. (v) As per treatments. (vi) Co—419. (vii) Irrigated. (viii) Interculturing and weeding. (ix) 58 cm. (x) 20.1.64.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 manurial treatments : $M_1$=224 Kg/ha. of N in 1 : 2 ratio as A/S and G.N.C., $M_2$=224 Kg/ha. of N as A/S, $M_3$=224 Kg/ha. of N as A/S+112 Kg/ha. of $P_2O_5$ and $M_4$=$M_3$+112 Kg/ha. of $K_2O$.

(2) 2 intensities of irrigations : $I_1$=Judgement and $I_2$=3/4 judgement.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 12·2 m.×7·5 m. (b) 9·8 m.×5·3 m. (v) and (vi) Yes.

4. GENERAL :

(i) Good. (ii) Stem borer controlled by spraying Folidol and endrine. (iii) Nil. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS :

(i) 1263·9 Q/ha. (ii) 98·1 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $I_1$ | 1254·1 | 1223·9 | 1227.7 | 1265·7 | 1242·8 |
| $I_2$ | 1287·0 | 1294·0 | 1313·7 | 1251·3 | 1285·0 |
| Mean | 1267·6 | 1259·0 | 1270·7 | 1258·5 | 1263·9 |

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**Crop :- Sugarcane (*Adsali*).** **Ref :- Ms. 60(102), 61(100).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'IM'.**

Object :—To find out ootimum water and manurial requirement for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Maize-*Jowar*-Sugarcane in 1960; Sugarcane; *Sannhemp* and Maize for 1961. (b) Maize—*Jowar* in 1960; *Sannhemp*—Maize in '61. (c) 24·7 C.L./ha. of F.Y.M. in '60; N.A. in '61. (ii) Black mixed alkaline. (iii) 20.7.60; 10,8.61. (iv) (a) Ploughing and harrowing, opening furrows. (b) Planted in furrows. (c) to (e) N.A. (v) 61·8 C.L./ha. of F.Y.M. (vi) Co—419. (vii) Irrigated. (viii) 2 interculturings; 6 to 7 weedings and earthing up. (ix) 109 cm.; 70 cm. (x) 4 to 9.2.62; 5 to 11.2.63.

2. TREATMENTS:

**Main-plot treatments :**

3 levels of N : $N_1$=252·2, $N_2$=336·2 and $N_3$=420·3 Kg/ha.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 2 levels of $P_2O_5$ : $P_0$=0 and $P_1$=112·1 Kg/ha.

(2) 2 intensities of irrigation : $I_0$=0 and $I_1$=3/4 judgement.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 14·6 m.×7·5 m. (b) 13·1 m.×5·3 m. (v) 76 cm.×105 cm. (vi) Yes.

4. GENERAL :

(i) Good. Lodging in June '61. (ii) Stem-borer controlled by mechanical means and spraying Folidol in '60. (iii) Yield of cane. (iv) (a) 1960—N.A. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Sub-plot error variances are heterogeneous.

5. RESULTS :

**60(102)**

(i) 1051·8 Q/ha. (ii) (a) 85·8 Q/ha. (b) 143·1 Q/ha. (iii) Interaction N×I is significant. (iv Av. yield of cane in Q/ha.

| | $N_1$ | $N_2$ | $N_3$ | $I_0$ | $I_1$ | Mean |
|---|---|---|---|---|---|---|
| $P_0$ | 1018·8 | 1034·9 | 1074·4 | 1044·2 | 1041·2 | 1042·7 |
| $P_1$ | 1103·4 | 1031·4 | 1047·8 | 1063·0 | 1058·8 | 1060·9 |
| Mean | 1061·1 | 1002·8 | 1153·9 | 1053·6 | 1050·0 | 1051·8 |
| $I_0$ | 1004·0 | 1002·8 | 1153·9 | | | |
| $I_1$ | 1118·2 | 1063·5 | 968·3 | | | |

C.D. for I means at the same level of N=173·5 Q/ha.
C.D. for N means at the same level of I=155·3 Q/ha.

**61(100)**

(i) 901·3 Q/ha. (ii) (a) 147·5 Q/ha (b) 82·1 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

| | $N_1$ | $N_2$ | $N_3$ | $I_0$ | $I_1$ | Mean |
|---|---|---|---|---|---|---|
| $P_0$ | 932·4 | 882·6 | 901·6 | 914·9 | 896·1 | 905·5 |
| $P_1$ | 961·8 | 849·6 | 880·1 | 914·4 | 879·9 | 897·2 |
| Mean | 947·1 | 866·1 | 890·8 | 914·6 | 888·0 | 901·3 |
| $I_0$ | 943·1 | 903·1 | 897·8 | | | |
| $I_1$ | 251·1 | 829·1 | 883·9 | | | |

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**Crop :- Sugarcane.** **Ref :- Ms. 60(208), 61(213), 62(206).**

**Site :- Reg. Res. Stn., Mandya.** **Type :- 'IM'.**

Object :—To study the effect of irrigation with different levels of N on the yield of Cane.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Sandy loam. (iii) 25.12.60; 2.9.61; 11.7.62. (iv) (a) Ploughing and 3 harrowings. (b) Planting setts. (c) 29652 setts/ha. (d) 91 cm. between rows. (e) N.A. (v) 84 Kg/ha. of $P_2O_5$+112 Kg/ha. of $K_2O$+28 C.L./ha. of compost. (vi) Co—419. (vii) Irrigated. (viii) Weeding and interculturing. (ix) 60 cm.; 110 cm.; 127 cm. (x) 7.2.62 ; 8.12.62; 24.9.63.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N : $N_1$=252 and $N_2$=336 Kg/ha.
(2) 2 levels of irrigation : $I_1$=Judgement and $I_2$=3/4th of judgement.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 7·6 m.×9·1 m.; 9·1 m.×9·1 m.; N.A. (b) 5·8 m. ×7·3 m.; 7·3 m.×7·3 m. in 61 and 62. (v) 91 cm.×91 cm. in 1960 and 1961 ; N.A. in '62. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Sugarcane. (iv) (a) 1960 to 62. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent.

3. RESULTS :

60(208)

(i) 1294 Q/ha. (ii) 137·5 Q/ha. (iii) No effect is significant. (iv) Av. yield of sugarcane in Q/ha.

| | $N_1$ | $N_2$ | Mean |
|---|---|---|---|
| $I_1$ | 1290 | 1371 | 1330 |
| $I_2$ | 1252 | 1262 | 1257 |
| Mean | 1271 | 1316 | 1294 |

61(213)

(i) 1374 Q/ha. (ii) 242·2 Q/ha. (iii) No effect is significant. (iv) Av. yield of sugarcane in Q/ha.

| | $N_1$ | $N_2$ | Mean |
|---|---|---|---|
| $I_1$ | 1341 | 1336 | 1339 |
| $I_2$ | 1396 | 1421 | 1409 |
| Mean | 1369 | 1379 | 1374 |

62(206)

(i) 1171 Q/ha. (ii) 134·8 Q/ha. (iii) No effect is significant. (iv) Av. yield of sugarcane in Q/ha.

| | $N_1$ | $N_2$ | Mean |
|---|---|---|---|
| $I_1$ | 1224 | 1157 | 1190 |
| $I_2$ | 1146 | 1158 | 1152 |
| Mean | 1185 | 1157 | 1171 |

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**Crop :- Sugarcane.** **Ref :- Ms. 64(164).**

**Site :- Reg. Res. Stn., Mandya.** **Type :- '1M'.**

Object :—To find out the water requirements and different levels of N.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Sandy loam. (iii) 24.10.64. (iv) (a) Ploughing. (b) Planting setts. (c) 29653 setts/ha. (d) 91 cm. between rows. (e) Nil. (v) 112 Kg/ha. of $K_2O$+84 Kg/ha. of $P_2O_5$ at planting. (vi) Co—419. (vii) Irrigated. (viii) Weeding and interculturing. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3).

(1) 4 irrigation levels : $W_1=51$, $W_2=76$, $W_3=102$ and $W_4=152$ ha. cm.
(2) 2 irrigation intervals : $I_1=4$ and $I_2=8$ days.
(3) 2 levels of N : $N_1=224$ and $N_2=336$ Kg/ha. of N.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 9·1 m.×8·2 m. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Cane yield. (iv) (a) 1964—N.A. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 878·8 Q/ha. (ii) 200·0 Q/ha. (iii) Main effects of W and I are significant. (iv) Av. yield of Cane in Q/ha.

| | $W_1$ | $W_2$ | $W_3$ | $W_4$ | $I_1$ | $I_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 613·6 | 802·0 | 889·7 | 991·3 | 934·3 | 713·9 | 824·1 |
| $N_2$ | 842·2 | 977·4 | 842·8 | 1071·4 | 1012·9 | 853·9 | 933·4 |
| Mean | 727·9 | 889·7 | 866·2 | 1031·3 | 973·6 | 784·0 | 878·8 |
| $I_1$ | 722·9 | 1008·6 | 972·7 | 1190·3 | | | |
| $I_2$ | 732·9 | 770·8 | 759·8 | 872·4 | | | |

C.D. for W marginal means=213·1 Q/ha.
C.D. for I marginal means=150·7 Q/ha.

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**Crop :- Sugarcane.** **Ref :- Ms. 62(37).**
**Site :- I.S.A.Farm, Munirabad.** **Type :- 'IM'.**

Object :— To improve the yield and quality of cane by applying molasses.

1. BASAL CONDITIONS :

(i) (a) Paddy—Sugarcane. (b) Paddy. (c) 24.7 C.L./ha. of F.Y.M.+44·8 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$. (ii) Black cotton soil. (iii) 4.3.62 (iv) (a) Deep ploughing by tractor followed by ridging. (b) Planting in furrows. (c) 24 710 setts/ha. (d) 91 cm. between rows. (e) N A. (v) N.A. (vi) Co-419 (late). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) March, 1963.

2. TREATMENT :

4 sett treatments : $T_0$=Control, $T_1$=Sett treatment with molasses, $T_2$=Through irrigation (Details N.A.) and $T_3$=Sett treatments irrigation with molasses.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 11·0 m.×9·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1962—N.A. (b) No. (c) Nil. (v) Sankeswar and Shimoga. (vi) Nil. (vii) Expt. conducted by S.R.S. Gangavathi.

5. RESULTS :

(i) 1283·0 Q/ha. (ii) 51·2 Q/ha. (iii) Treatment differences are significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av. yield | 1293·5 | 1288·5 | 1230·1 | 1319·9 |

C.D.=63·0 Q/ha.

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**Crop :- Sugarcane.** **Ref :- Ms. 60(184).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'D'.**

Object :— To find suitable programme of controlling weeds.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Ragi*. (c) N.A. (ii) Sandy loam (red soil). (iii) 8.6.1960. (iv) (a) Ploughing, clod-owsing and levelling. (b) Planting setts. (c) 30,000 setts/ha. (3eyebed/sett). (d) 91 cm. between rows. (v) 112 Q/ha. of F.Y.M.+84 Kg/ha. of $P_2O_5$ at planting. 336 Kg/ha. of N as A/S in 4 doses. (vi) Co-419. (vii) Irrigated. (viii) As per treatments. (ix) N.A. (x) 16.7.1961.

2. TREATMENTS :

10 cultural-cum weedicidal treatments : $T_0$=Control—No weeding and spraying, $T_1$=Pre-emergence spray of 2·24 Kg/ha. of 2-4, D as Hedanol, $T_2$=Pre+Post emergence spray of 2·24 Kg/ha. of 2-4,D as Hedanol, $T_3$=$T_2$+3rd spray at earthing up, $T_4$=Pre-emergence spray of Hedanol+inter-culturing, $T_5$=Pre+Post spray of Hedanol+inter culturing, $T_6$=$T_5$+3rd spraying at earthing up, $T_7$=Pre+Post emergence spray of 2·24 Kg/ha. of 2-4, D +5·6 Kg/ha. of Dowpon, $T_8$=Two hand weedings only and $T_9$ =Pre +Post emergence spray of 5·6 Kg/ha. of Dowpon.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×5·5 m. (b) 7·3 m.×3·7 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Germination, tillering, weed counts and cane yield. (iv) (a) 1959 to 1965 (slightly modified every year). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2988 Q/ha. (ii) 415·4 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 3290 | 3110 | 2910 | 2810 | 2950 | 2930 | 3120 | 2800 | 3160 | 2800 |

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**Crop :- Sugarcane (*Adsali*).** **Ref :- Ms. 61(182).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'D'.**

Object :—To find out suitable methods for controlling weeds.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Ragi*. (c) N.A. (ii) Sandy loam (red soil). (iii) 25.6.61. (iv) (a) Ploughing, clod crushing and levelling. (b) Planting setts. (c) 32,000 setts/ha. (3 eyebuds/sett). (d) 91 cm. between rows. (e) Nil. (v) 112 Q/ha. of F.Y.M.+84 Kg/ha. of $P_2O_5$ at planting, 336 Kg/ha. of N as A/S in 4 doses. (vi) Co—419. (vii) Irrigated. (viii) As per treatments. (ix) N.A. (x) 25.11.62.

2. TREATMENTS :

6 cultural-weedicidal treatments : $T_1$=Pre emergence spray of Hedanol (2—4, D)+1 weeding after 8 weeks, $T_2$=Pre and post emergence spray of Hedanol (2—4, D), $T_3$=Pre and post emergence spray of Hedanol (2—4, D)+interculturing, $T_4$=$T_2$+3rd spray at earthing up, $T_5$=Pre and post emergence spray of Hedanol+post emergence spray of Dowpon at 5·6 Kg/ha.+interculturing and $T_6$=2 weedings only.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 9·1 m.×3·7 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Germination counts and cane yield. (iv) (a) 1959 to 65 (modified every year). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1849 Q/ha. (ii) 184·2 Q/ha. (iii) Treatment differences are significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 2022 | 2033 | 1767 | 1731 | 1720 | 1820 |

C.D.=277·6 Q/ha.

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**Crop :- Sugarcane (*Adsali*).** **Ref :- Ms. 62(165).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'D'.**

Object :—To find out suitable method of controlling weeds.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Ragi*. (c) N.A. (ii) Sandy loam (red soil). (iii) 18.9.62. (iv) (a) Ploughing, clod crushing and levelling. (b) Planting setts. (c) 32,000 setts/ha. (3 eyebuds/sett). (d) 91 cm. between rows. (e) Nil. (v) 112 Q/ha. of F.Y.M.+84 Kg/ha. of $P_2O_5$ at planting. 336 Kg/ha. of N as A/S in 4 doses. (vi) Co—419. (vii) Irrigated. (viii) As per treatments. (ix) N.A. (x) 29.10.63.

2. TREATMENTS :

4 cultural-weedicidal treatments : $T_1$=Hedanol pre and post emergence spraying at 2·2 Kg/ha. of active acid+interculturing, $T_2$=2 weedings+interculturings, $T_3$=Pre and post emergence spraying of Simazine at 5.6 Kg/ha. and interculturing and $T_4$= $T_3$+post emergence spray of Dowpon at 11·2 Kg/ha.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) and (b) 9·1 m.×1·8 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Germination counts and yield of cane. (iv) (a) 1959—65 (Treatments modified every year). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1748 Q/ha. (ii) 221·0 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 1693 | 1843 | 1725 | 1738 |

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**Crop :- Sugarcane (*Adsali*).** **Ref :- Ms 63(162).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'D'.**

Object :—To find suitable method of controlling weeds.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Ragi*. (c) N.A. (ii) Sandy loam. (iii) 20.9.63. (iv) (a) Ploughing, clod crushing and levelling, (b) Planting setts. (c) 32,000 setts/ha. (6 eyebuds/sett). (d) 91 cm. between rows. (e) Nil. (v) 84 Kg/ha. of $P_2O_5$ at planting+336 Kg/ha. of N in 4 doses. (vi) Co—419. (vii) Irrigated. (viii) As per treatments. (ix) N.A. (x) 25.11.64.

2. TREATMENTS :

4 weedicidal treatments : $T_0$=Control,$T_1$=Spraying Hedanol (2—4, D) at 2·7 Kg/ha.of active acid (16.9.63), $T_2$=Pre and post emergence spray as above, $T_3$=Simazine pre emergence spray at 5·4 Kg/ha. and $T_4$=Pre and post emergence spray of Hedanol (2—4, D)+post emergence spray of Simazine at 5·4 Kg/ha.

3. DESIGN :

(i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 6·1 m.×7·3 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Germination count and yield of Cane. (iv) (a) 1959 to 65 (Treatments modified every year). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1258 Q/ha. (ii) 215·1 Q/ha. (iii) Treatment differences are not significant. (iv) Av, yield of sugarcane in Q/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. yield | 1140 | 1257 | 1195 | 1276 | 1422 |

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**Crop :- Sugarcane (*Adsali*).** **Ref :- Ms. 64(117).**

**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'D'.**

Object :—To find out suitable programme of controlling weeds of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Ragi*. (c) N.A. (ii) Sandy loam (red soil). (iii) 21.6.64. (iv) (a) Ploughing, clod crushing, levelling. (b) Planting setts. (c) 30,000 setts/ha. (3 eyebud/sett). (d) 91 cm. between rows. (e) Nil. (v) N at 336 Kg/ha. in 4 doses+84 Kg/ha. of $P_2O_5$ at planting. (vi) Co—419. (vii) Irrigated. (viii) As per treatments. (ix) 238 cm. (x) 17.10.65.

2. TREATMENTS .

6 weedicidal treatments : $T_0$=Control, $T_1$=Pre and post emergence spray of 2, 4—D (Hedonal), $T_2$=Pre emergence spray of Simazine, $T_3$=Pre and post emergence spray of Simazine, $T_4$=$T_2$+Dowpon as in $T_3$ and $T_5$=Pre and post emergence of Hedonal+Dowpon.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 7·9 m.×10·1 m. (b) 6·1 m.×8·2 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Germination, tillering and weed counts. (iv) (a) 1959—65 (Treatments modified every year). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 1751·5 Q/ha. (ii) 199·3 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in Q/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1479·9 | 1823·8 | 1734·1 | 1659·3 | 1878·6 | 1933·4 |

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**Crop :- Sugarcane.** **Ref :- Ms. 65(38).**

**Site :- Reg. Res. Stn., Mandya.** **Type :- 'D'.**

Object :— To find out the best method of controlling weeds.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Sandy loam. (iii) 26.10.1965. (iv) (a) Ploughing with kolar mould plough. (b) Planting setts. (c) 30,000 setts/ha. (3 eyebud/sett. (d) 91 cm. between rows. (e) N.A. (v) 84 Kg/ha. of Super+268·8 Kg/ha. of N applied in 4 split doses. (vi) Co-419. (vii) Irrigated, (viii) Hand weeding, 2 to 3 times interculturing and earthing up. (ix) 102 cm. (x) 10 and 11.12.1966.

2. TREATMENTS :

6 weedicidal treatments :

$T_0$=Control (No spraying), $T_1$=Pre and post emergence spraying of 2, 4-D (Hedanol), $T_2$=Pre-emergence spraying of Simazine (Tafazine only), $T_3$=Pre and post emergence spraying of Simazine (in the form of Tafazine), $T_4$=Pre and post emergence spraying of Simazine+Dowpon and $T_5$=Pre and post emergence spraying of Hedanol+Dowpon.

[Hedanol 80%, 2, 4-D at 12 gm./plot. Tafazine 50% at 24 gm./plot. Dowpon (Sodium salt of 2, 2 at 24 gm./plot).

Ist spray on 30.10.65, IInd spray on 12.11.65.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) N.A. (b) 6·10 m.×8·2 m. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of cane. (iv) 1959 to 1965 (Treatments modified every year). (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 959·8 Q/ha. (ii) 258·1 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1063·2 | 1145·8 | 903·3 | 962·1 | 955·6 | 728·5 |

**Crop :- Sugarcane.** **Ref : Ms. 63(196), 64(157).**

**Site :- Reg. Res. Stn., Mandya.** **Type :- 'D'.**

Object :— To control the early loss of vigour in Sugarcane with the help of different fungicides.

1. BASAL CONDITIONS:

(i) (a) Fallow—Sugarcane (1963) ; Groundnut—Sugarcane (1964). (b) Fallow (1963) ; Groundnut and (Sugarcane 1964. (c) N.A. (ii) Sandy loam. (iii) 11.7 1963 ; 31.10.1964. (iv) (a) Ploughing. (b) Planting setts. (c) 25,000 setts/ha. (1963). 30,000 setts/ha. (1964). (d) 91 cm. between rows. (e) Nil. (v) 28 C.L./ha. of F.Y.M +84 Kg/ha. of $P_2O_5$+112 Kg/ha. of $K_2O$+336 Kg/ha. of N as G.N.C. in 4 doses. (vi) Co-419. (vii) Irrigated. (viii) Digging, passing tin harrows and blade harrows 3 times. (ix) N.A. (x) 3.10.1964 : 31.1.1966.

2. TREATMENTS :

10 fungicidal treatments : $T_0$=Control (T.D.: Top dressing only), $T_1$=Fungicides+T.D. (Bordeaux mixture one day prior to planting in 455 litres of water, $T_2$=Heptachlor EC+T.D. (6% dust 28 Kg/ha. soil application—7 days prior to planting), $T_3$=Heptachlor dust+T.D. (in 371 litres of water one at planting—one at one month after planting, $T_4$=T.D. only N in 8 doses at planting, 6, 10, 14, 18, 22, 26 and 30th week after planting in 5, 10, 20, 25, 15, 15, 5 and 5% respectively, $T_5$=$T_4$+mineral elements (56 Kg/ha. of Mg. Phos.+4·5 Kg/ha. of Fe. Sul.+4·5 Kg/ha. of Cu. Sul. 4·5 Kg/ha. of Borax+6·7 Kg/ha. of Mn.+9 Kg/ha. of Zn. Sul.), $T_6$=40 C.L./ha. of compost+T.D., $T_7$=40 C.L./ha. of compost+T.D. as A/S and G.N.C. in 30 : 70 ratio, $T_8$=Nematicide+T.D. (173 litres/ha. Shell D.D. at 30 cm. sq. distance 20 days prior to planting and $T_9$=G.L. manuring (112 Q/ha. of glyricidia).

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 9·1 m.×9·1 m. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Cane yield. (iv) 1962 to 1965 (Treatment modified in 1963 and 1965). (b) No. (c) Nil. (v) and (vi) N.A. (vii) Error variances are heterogeneous. Treatments×years interaction is absent.

5. RESULTS :

63(196)

(i) 2091 Q/ha. (ii) 116·5 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 1933 | 2175 | 2158 | 2073 | 2022 | 2113 | 2186 | 2143 | 2072 | 2036 |

64(157)

(i) 1629 Q/ha. (ii) 243·9 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 1532 | 1794 | 1553 | 1607 | 1527 | 1350 | 1707 | 1775 | 1596 | 1853 |

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**Crop :- Sugarcane.** **Ref :- Ms. 65(37).**

**Site :- Reg. Res. Stn., Mandya.** **Type :- 'D'.**

Object :—To control early loss of vigour in Sugarcane.

1. BASAL CONDITIONS

(i) (a) to (c) Nil. (ii) Sandy loam. (iii) 16.10.65. (iv) (a) Ploughing, clod crushing and levelling. (b) Planting setts. (c) 29,640 setts/ha. (3 eyebuds/sett). (d) 91 cm. between rows. (e) Nil. (v) 24·7 C.L./ha. of F.Y.M. (vi) Co—419. (vii) Irrigated. (viii) Hand weeding, 2 to 3 interculturings and earthing up. (ix) 102 cm. (x) 10.12.66.

2. TREATMENTS :

10 fungicidal treatments : $T_0$=Control (T.D. : Top dressing only standard method), $T_1$=Fungicides+T.D. (Bordeaux mixture 1 day prior of planting), $T_2$=Heptachlor dust+T.D. (6%dust at 28 Kg/ha.7 days prior to planting),$T_3$=Heptachlor E.C.+T.D.(1235 c.c./ha. in 680 litres of water in 2 applications, $\frac{1}{2}$ at planting other $\frac{1}{2}$ at earthing up), $T_4$=T.D. only of P and K at planting. (N=336 Kg/ha. in 8 doses at planting, 6, 10, 14, 18, 22, 26 and 30 week after planting in 5, 10, 20, 25, 15, 15, 5 and 5 % respectively. After final earthing up N is given through irrigation water, $T_5$=T.D with N (336 Kg/ha.) in 8 doses+all minor elements Mg. Phos., Fe. Sul., Cu. Sul.; Borax, Mn. and Zn. Sul.), $T_6$=98·8 C.L./ha. of compost+T.D., $T_7$=98·8 C.L./ha. of compost+T.D. (N as A/S and G.N.C.), $T_8$=Numaticide+T.D. (618 litres/ha. applied 15 to 20 days prior to planting), and $T_9$=Green leaf manuring+T.D. (112 Q/ha. of G.M. as Glyricide).

T.D.=336 Kg/ha. of N as G.N.C.+84 Kg/ha. of $P_2O_5$ as Super+112 Kg/ha. of $K_2O$.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 9·1 m.×9·1 m. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Fair. (ii) Nil. (iii) Cane yield. (iv) (a) 1962 to 65 (Treatments modified in 62 and 66). (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1889 Q/ha. (ii) 332·7 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cane in Q/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 1902 | 1549 | 1982 | 1784 | 1819 | 1946 | 2042 | 2173 | 1767 | 1925 |

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**Crop :- Sugarcane (*Adsali*).** **Ref :- Ms. 61(190).**
**Site :- Sugarcane Res. Stn., Mandya.** **Type :- 'CD'.**

Object :—To find out the best method of controlling *Hariyali* (weeds).

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) Sandy loam. (iii) N.A. (iv) (a) Ploughing with *kolar* mould board plough. (b) Planting setts. (c) 29640 setts/ha. (3 eyebud/sett). (d) 91 cm. between rows. (e) Nil. (v) Nil. (vi) Co—419 (late). (vii) Unirrigated. (viii) N.A. (ix) Normal. (x) N.A.

2. TREATMENTS :

4 spraying treatments : $T_0$=Control, $T_1$=Spraying with 22 Kg/ha. of Dowpon in 273 to 364 litres of water once, $T_2$=2 sprayings with 22 Kg/ha. of Dowpon in 273 to 364 litres of water and $T_3$=Ploughing and spraying with 22 Kg/ha. of Dowpon in 273 to 364 litres of water just before sprouting.

$T_1$ applied on 16.7.61, $T_2$ on 16.7.61 and 24.8.61 and $T_3$ on 24.8.61.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 10·1 m. × 10·1 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Weed counts. (iv) (a) 1961 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 68·1°. (ii) 6·7°. (iii) Treatment differences are highly significant. (iv) Av. angle and percentage of weeds per 3 random spots of 90 cm. × 90 cm.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Mean angle | 41·8° | 72·0° | 79·8° | 78·8° |
| Percentage | 44·4% | 90·5% | 96·9% | 96·2% |

C.D.=8·1%.

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**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 63(236).**

**Site :- Agri. Res. Stn., Bagalkot.** **Type :- 'M'.**

Object :—To find out the best method of application of fertilisers on dry land Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Rabi Jowar*. (c) N.A. (ii) Deep black soil. (iii) 5.9.63. (iv) (a) 3 harrowings. (b) Sowing with 61 cm. seed drill. (c) 9 Kg/ha. (d) 61 cm. × 30 cm. (e) 2. (v) Nil. (vi) *Jayadhar* (medium). (vii) Unirrigated. (viii) Interculturing. (ix) 69 cm. (x) 22.2.64 and 25.3.64.

2. TREATMENTS :

6 times and methods of application of fertilizers : $T_0$=Control (no fertilizer), $T_1$=Normal method (fertilizers spreading), $T_2$=2/3 at ploughing broadcasted+1/3 at sowing lines, $T_3$=Spreading 2/3 at sowing line and spraying $\frac{1}{3}$ at flowering, $T_4$=Spreading 2/3 at sowing line and spraying 1/3 at flowering and $T_5$=Full dose at ploughing.

Fertilizer dose is 16·8 Kg/ha. of N+16·8 Kg/ha. of $P_2O_5$.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 65·8 m. × 11·3 m. (iii) 4. (iv) (a) 11·0 m. × 11·0 m. (b) 10·1 m. × 10·1 m. (v) 91 cm. border alround. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Height, boll counts. Yield of *kapas*. (iv) (a) 1963 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 498 Kg/ha. (ii) 55·3 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 415 | 583 | 546 | 495 | 502 | 448 |

C.D.=83·3 Kg/ha.

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**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 62(200).**

**Site :- Soil Cons. Res. Stn., Bellary.** **Type :- 'M'.**

Object :—To evaluate the responses to the application of spartin—B under rainfed conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) Deep black cotton soil. (iii) 10.9.62. (iv) (a) 4 light harrowings. (b) Dibbling. (c) 11 Kg/ha. (d) 91 cm.×23 cm. (e) 2. (v) As per treatments. (vi) Western 1 (late). (vii) Unirrigated. (viii) 3 hand weedings and 1 hoeing. (ix) 36 cm. (x) 22.4.63.

2. TREATMENTS :

All combinations of (1) and (2)+a control (no manure)

(1) 2 levels of manures : $M_1$=5600 Kg/ha. of F.Y.M. and $M_2$=22·4 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$.

(2) 2 levels of spartin B : $L_0$=0 and $L_1$=370 Kg/ha.

Spartum B is a synthetic mixture of micronutrients.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 5. (b) 18·3 m.×3·7 m. (iii) 6. (iv) (a) 3·7 m.×3·7 m. (b) 2·7 m.×2·7 m. (v) 46 cm.×46 cm. (vi) Yes.

4. GENERAL :

(i) Shedding of leaves due to disease and shedding of flowers due to heavy rains. (ii) Disease observed. Control measures not taken. (iii) Height measurements, Boll counts, yield of *kapas*. (iv) (a) 1962 to 64 (modified in 63). (b) No. (c) Nil. (v) Nil. (vi) Heavy and unusual rains during Dec. '62. (vii) Nil.

5. RESULTS :

(i) 145 Kg/ha. (ii) 53·4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

$T_0$=139 Kg/ha.

| | $M_1$ | $M_2$ | Mean |
|---|---|---|---|
| $L_0$ | 133 | 145 | 139 |
| $L_1$ | 181 | 127 | 154 |
| Mean | 157 | 136 | 146 |

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 63(191), 64(147).**

**Site :- Soil Cons. Res. Stn., Bellary.** **Type :- 'M'.**

Object :— To evaluate the responses to the application of Spartin—B under rainfed conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar* ; Cotton. (c) Nil. (ii) Deep black cotton soil. (iii) 24.9.1963 ; 19.9.1964. (iv) (a) 4 light harrowings. (b) Dibbling. (c) 11 Kg/ha. (d) 91 cm.×23 cm. (e) One. (v) As per treatments. (vi) Western 1 (late). (vii) Unirrigated. (viii) 3 hand weedings and 1 hoeing. (ix) 15 cm. ; 21 cm. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)+2 extra treatments.

(1) 2 levels of manures : $M_1$=5600 Kg/ha. of F.Y.M. and $M_2$=22·4 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$.

(2) 2 levels of Spartin B : $L_0$=0 and $L_1$=370 Kg/ha.

2 extra treatments : $T_0$=Control, $T_1$=5600 Kg/ha. of F.Y.M.+22·4 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$+370 Kg/ha. of Spartin B.

Spartin B is a synthetic mixture of micronutrients for alkaline soils.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) 21·9 m.×11·0 m. (iii) 4. (iv) (a) 7·3 m.×5·5. (b) 5·5 m.×4·3 m. (v) 91 cm.×61 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Height measurements, boll counts and yield of *kapas*. (iv) (a) 1962 to 1964 (treatments modified in 1963. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments × years interaction is absent,

5. RESULTS :

**63(191)**

(i) 226 Kg/ha. (ii) 33·9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

$T_0$=227 Kg/ha., $T_1$=223 Kg/ha.

| | $M_1$ | $M_2$ | Mean |
|---|---|---|---|
| $L_0$ | 211 | 221 | 216 |
| $L_1$ | 249 | 223 | 236 |
| Mean | 230 | 222 | 226 |

**64(14)**

(i) 356 Kg/ha. (ii) 84·1 Kg/ha. (iii) None of the effects is significant) (iv) Av. yield of *kapas* in Kg/ha.

$T_0$=307 Kg/ha., $T_1$=390 Kg/ha.

| | $M_1$ | $M_2$ | Mean |
|---|---|---|---|
| $L_0$ | 346 | 333 | 340 |
| $L_1$ | 403 | 356 | 380 |
| Mean | 374 | 345 | 360 |

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 60(12), 62(201), 63(190), 64(148).**

**Site :- Soil Cons. Res. Stn., Bellary.** **Type :- 'M'.**

Object :— To find out the optimum dose of N and P for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) As per treatments. (ii) Black cotton soil. (iii) 25.9.1960 ; 8.9.1962 ; 27.9.1963 ; 19.9.1964. (iv) (a) 2 harrowings. (b) Drilling. (c) 8 Kg/ha. (d) 91 cm. between rows. (e) N.A. (v) Nil. (vi) Western—1 (late). (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 15 cm. ; 36 cm. ; 15 cm.; 21 cm. (x) 15.3.1961 ; 30.3.1963 ; N.A. ; N.A.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 3 levels of N as A/S : $N_0$=0, $N_1$=22·4 and $N_2$=44·8 Kg/ha.
(2) 4 levels of $P_2O_5$ as Super : $P_0$=0, $P_1$=22·4, $P_2$=44·8 and $P_3$=112·1 Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) 38·4 m. × 2·1 m. (b) 36·6 m. × 1·5 m. (v) 91 cm. × 30 cm. (vi) Yes.

### 4· GENERAL :

(i) Satisfactory except poor in 1962 and 1963. (ii) Nil. (iii) Height of plants. boll count and yield of *kapas*. (iv) (a) 1960—1964. (b) Yes. (c) As under 5. Results. (v) and (vi) Nil. (vii) Experiment failed in 1961. Error variances are homogeneous. Treatments × years interaction is absent.

### 5. RESULTS :

(i) 193 Kg/ha. (based on 121 d.f. made up of pooled error and Treatments × years interaction). (iii) Main effect of P alone is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $P_3$ | Mean |
|---|---|---|---|---|---|
| $N_0$ | 145 | 195 | 223 | 198 | 190 |
| $N_1$ | 178 | 209 | 196 | 191 | 194 |
| $N_2$ | 183 | 193 | 212 | 195 | 196 |
| Mean | 169 | 199 | 210 | 195 | 193 |

C.D. for P marginal means=17·0 Kg/ha.

| Years | $P_0$ | $P_1$ | $P_2$ | $P_3$ | Sig. | $N_0$ | $N_1$ | $N_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 205 | 238 | 246 | 230 | N.S. | 223 | 218 | 248 | N.S. | 230 | 37·7 |
| 1962 | 103 | 137 | 131 | 136 | N.S. | 140 | 118 | 122 | N.S. | 127 | 33·7 |
| 1963 | 126 | 149 | 154 | 138 | N.S. | 134 | 150 | 142 | N.S. | 142 | 30·2 |
| 1964 | 241 | 272 | 309 | 275 | * | 264 | 288 | 271 | N.S. | 274 | 42·7 |
| Pooled | 169 | 199 | 210 | 195 | * | 190 | 194 | 196 | N.S. | 193 | 36·4 |

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**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 65(1).**

**Site :- Soil Cons. Res. Stn., Bellary.** **Type :- 'M'.**

Object :— To study the effect of different form of fertilizers on the yield of Cotton.

### 1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Jowar*, (c) 5000 Kg/ha. of F.Y.M. (ii) Deep black cotton soil. (iii) 23.9.65. (iv) (a) Ploughing and harrowing. (b) Dibbling by the dibbler 5 to 6 cm. below the surface. (c) N.A. (d) 30 cm. × 30 cm. (e) 1. (v) 40 Kg/ha. of $P_2O_5$ as Super applied to all plots. (vi) D.R. 72 cotton (early). (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 66 cm. (x) 2.1.66.

### 2. TREATMENTS :

6 sources of 40 Kg/ha. of N : $S_0$=Control (no N applied), $S_1$=Urea, $S_2$=A/S, $S_3$=Amm. Phos., $S_4$=Nitro Phos. and $S_5$=C/N.

### 3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 7·3 m. × 5·5 m. (b) 6·7 m. × 5·5 m. (v) One row on either side. (vi) Yes.

### 4. GENERAL :

(i) Not normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1965—N.A. (b) and (c) N.A. (v) N.A. (vi) The crop affected adversely by sever drought. (vii) Nil.

5. RESULTS :

(i) 139 Kg/ha. (ii) 44·5 Kg/ha, (iii) The treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 126 | 146 | 118 | 126 | 178 | 138 |

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 60(15).**

**Site :- Soil Cons. Res. Stn., Bellary.** **Type :- 'M'.**

Object :—To find out the effect of trace elements on Cotton.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Black cotton soil. (iii) 27.9.60. (iv) (a) Harrowing. (b) Drilling. (c) 8 Kg/ha. (d) 91 cm. between rows. (e) N.A. (v) Nil. (vi) W—1 Cotton. (vii) Unirrigated. (viii) Interculturing and weeding. (ix) 15 cm. (x) 15.3.61.

2. TREATMENTS :

9 trace elements : $M_0$=Control (no trace elements), $M_1$=Standard (all trace elements viz. Mg.+Fe. +Mn.+Zn.+Cul.+Boron+Molybdenum), $M_2$=$M_1$ except Mg., $M_3$=$M_1$ except Fe,, $M_4$=$M_1$ except Mn., $M_5$=$M_1$ except Zn., $M_6$=$M_1$ except Cu., $M_7$=$M_1$ except Boran and $M_8$ =$M_1$ except Molybdenum.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 6·4 m.×4·9 m. (b) 4·6 m.×3·1 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Boll counts and yield of *kapas*. (iv) (a) 1958—60. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 161 Kg/ha. (ii) 57·7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ | $M_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 206 | 140 | 226 | 114 | 137 | 178 | 152 | 132 | 168 |

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 60(14).**

**Site :- Soil Cons. Res. Stn., Bellary.** **Type :- 'M'.**

Object :—To find out the optimum dose and frequency of application of F.Y.M.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Cotton. (c) As per treatments. (ii) Black cotton soil. (iii) 25.9.60. (iv) (a) Harrowing. (b) Drilling. (c) 8 Kg/ha. (d) 91 cm. between lines. (e) N.A. (v) As per treatments. (vi) W—1 Cotton. (vii) Unirrigated. (viii) Interculturing and weeding. (ix) 11 cm. (x) 16.3.61.

2. TREATMENTS :

7 manurial treatments : $M_0$=Control (2 plots), $M_1$=22·4 Q/ha. of F.Y.M. every year, $M_2$=44·8 Q/ha. of F.Y.M. alternate years (from 1st year), $M_3$=44·8 Q/ha. of F.Y.M. alternate years (from 2nd year), $M_4$=67·3 Q/ha. of F.Y.M. every 3rd year (from 1st year), $M_5$=67·3 Q/ha. of F.Y.M. every 3rd year (from 2nd year) and $M_6$=67·3 Q/ha. of F.Y.M. every 3rd year (from 3rd year).

3. DESIGN:

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 13·7 m.×9.1 m. (b) 11·9 m.×7 3 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Boll counts and yield of *kapas*. (iv) (a) 1958 –N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 151 Kg/ha. (ii) 38·6 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 131 | 159 | 211 | 124 | 165 | 161 | 129 |

C.D. for comparison of $M_0$ vs. others =49·2 Kg/ha.

C.D. for comparison of two means other than $M_0$=56·8 Kg/ha.

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 64(89).**

**Site :- Agri. College Farm, Dharwar.** **Type :- 'M'.**

Object :—To find out suitable placement method and kind of fertilizer for Cotton in red soil.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Jowar*. (c) N.A. (ii) Red sandy loam. (iii) 29.8.64. (iv) (a) Ploughing, grubbling and harrowing. (b) Dibbling. (c) N.A. (d) 61 cm.×30 cm. (e) 2. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) Interculturing and weeding. (ix) 40 cm. (x) 12.2.65 and 12.3.65.

2. TREATMENTS:

All combinations of (1) and (2) with 32·1 Kg/ha. of $P_2O_5$ as Super+a control.

(1) 4 sources of N at 44·5 Kg/ha. : $S_1$=A/S, $S_2$=Urea, $S_3$=C/A/N and $S_4$=A/S/N.

(2) 4 methods of placement : $M_1$=By plough sole 8cm. deep a week before sowing, $M_2$=$P_2O_5$ by plough sole a week before sowing and N by seed-cum-fertilizer drill at sowing, $M_3$=Placement 5 cm. deep and 5 cm. to the side of the seed line and $M_4$=Fertilizer through seed drill and seed through the straw tubes attached behind the seed drill.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 17. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×6·1 m. (b) 7·9 m.×4·9 m. (v) 61 cm.× 61 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1964. (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 786 Kg/ha. (ii) 228·7 Kg/ha. (iii) Main effect of S and 'control *vs.* others' are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=450 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $S_1$ | 543 | 768 | 848 | 899 | 764 |
| $S_2$ | 703 | 710 | 654 | 741 | 702 |
| $S_3$ | 1034 | 997 | 724 | 959 | 929 |
| $S_4$ | 861 | 868 | 817 | 781 | 832 |
| Mean | 785 | 836 | 761 | 845 | 807 |

C.D. for S marginal means =162·8 Kg/ha.
C.D. for comparison of control *vs.* others=237·3 Kg/ha.

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**Crop :- Cotton.** **Ref :- Ms. 63(133).**
**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'M'.**

Object :—To determine the optimum dose of fertilizers and manures for *Jayadhar* Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 63 Q/ha. of F.Y.M. (ii) Deep black cotton soil. (iii) 14.8.63. (iv) (a) 2 ploughings, cross ploughing and 2 harrowings. (b) Dibbled in furrows. (c) to (e) N.A. (v) Nil. (vi) *Jayadhar*. (vii) Unirrigated. (viii) 3 intercultivation and 3 weedings. (ix) 41 cm. (x) 2 to 19.3.64.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4).

(1) 3 levels of F.Y.M, : $F_0=0$, $F_1=62·8$ and $F_2=125·6$ Q/ha.
(2) 3 levels of N : $N_0=0$, $N_1=28·0$ and $N_2=56·0$ Kg/ha.
(3) 3 levels of $P_2O_5$ : $P_0=0$, $P_1=28·0$ and $P_2=56·0$ Kg/ha.
(4) 3 levels of $K_2O$ : $K_0=0$, $K_1=28·0$ and $K_2=56·0$ Kg/ha.

3. DESIGN :

(i) $3^4$ confd. (ii) (a) 9 plots/block, 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 2·4 m.× 7·3 m. (v) 2 rows on all sides. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 731 Kg/ha. (ii) 118·8 Kg/ha. (iii) Main effect of N is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 675 | 712 | 745 | 745 | 710 | 677 | 759 | 705 | 667 | 710 |
| $F_1$ | 654 | 783 | 733 | 711 | 712 | 747 | 737 | 708 | 725 | 723 |
| $F_2$ | 680 | 698 | 815 | 733 | 776 | 684 | 746 | 736 | 712 | 731 |
| Mean | 670 | 731 | 764 | 729 | 733 | 703 | 747 | 716 | 701 | 721 |
| $K_0$ | 764 | 695 | 784 | 751 | 776 | 715 | | | | |
| $K_1$ | 632 | 765 | 752 | 704 | 707 | 738 | | | | |
| $K_2$ | 614 | 733 | 756 | 733 | 715 | 656 | | | | |
| $P_0$ | 667 | 750 | 771 | | | | | | | |
| $P_1$ | 710 | 737 | 751 | | | | | | | |
| $P_2$ | 632 | 706 | 770 | | | | | | | |

C.D. for N marginal means=65·4 Kg/ha.

**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 60(268), 61(264).**

**Site :- Agri. Res. Stn., Dharwar.** **Type -: 'M'.**

Object :—To study the effect of N and P on Cotton crop.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) N.A. (ii) Medium black soil. (iii) 13.8.1960 ; 11.8.1961. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) 9 Kg/ha. (d) 61 cm.×30 cm. (e) 1. (v) Nil. (vi) *Laxmi* Cotton. (vii) Unirrigated. (viii) Intercultivations by implements. (ix) 22 cm. ; 25cm. (x) 19.1.1961 ; N.A.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 2 levels of N as A/S : $N_0$=0 and $N_1$=22·4 Kg/ha.
(2) 2 levels of $P_2O_5$ as Super : $P_0$=0 and $P_1$=16.8 Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 9.1 m.×7·3 m. (b) 6·7×6·1 m. (v) 120 cm. ×60 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1960—61 (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous. Treatments × years interaction is absent.

5. RESULTS :

**61 (268)**

(i) 812 Kg/ha. (ii) 182. 1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Ka/ha.

| | $P_0$ | $P_1$ | Mean |
|---|---|---|---|
| $N_0$ | 920 | 756 | 838 |
| $N_1$ | 842 | 730 | 786 |
| Mean | 881 | 743 | 812 |

**61(264)**

(i) 553 Kg/ha. (ii) 79·3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | Mean |
|---|---|---|---|
| $N_0$ | 558 | 568 | 563 |
| $N_1$ | 554 | 532 | 543 |
| Mean | 556 | 550 | 553 |

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**Crop :-Cotton (*Rabi*).** **Ref :- 60(119), 61(97), 62(79), 63(103).**

**Site :- Agri. College Farm, Dharwar.** **Type :- 'M'**

Object :—To find out suitable placement method of application of fertilizers to Cotton.

1. BASAL CODITIONS :

(i) (a) to (c) N.A. (ii) Black cotton soil. (iii) 20.8.1960 ; 22.8.1961; 17.8.1962 ; 17.8.1963. (iv) (a) Ploughing, clod crushing and harrowing. (b) N.A. ; N.A. ; Dibbling ; N.A. (c) to (e) N.A. (v) Nil. (vi) *Jayadhar*. (vii) Unirrigated. (viii) Interculturing, weeding and spraying. (ix) N.A. (x) 6.2.1961 to 4.3.1961; 10.2.1962 to 9.4.1962; 7 pickings dates N.A.; 7.2.1964 to 31.3.1964.

2. TREATMENTS :

All combinations of (1) and (2) +one control.

(1) 2 manurial treatments : $T_1$=33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ and $T_2$=50·4 Kg/ha. of N+ 33·6 Kg/ha. of $P_2O_5$.

(2) 4 methods of placement: $M_1$=By plough sole method 13 cm. deep about one week before sowing, $M_2$=To drop in the same line when the seed is sown by S.C.F. drill, $M_3$=To drop 4 cm. deeper than seed in the same line with S.C.F. drill and $M_4$=To drop 5 cm. deep and 5 cm. away from the seed line by S.C.F. drill.

S.C.F. means seed-cum-fretilizer drill.

3. DESIGN :

(i) Fact. R. B. D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 9·1 m×6·1 m. (b) 7·3 m×4·9 m. (v) 91 cm.×61 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1959 to 1963. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent.

5. RESULTS :

60(119)

(i) 718 Kg/ha. (ii) 68·6 Kg/ha. (iii) Main effect of M is highly significant and 'control vs. other' treatments effect is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=650 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $T_1$ | 763 | 743 | 670 | 658 | 708 |
| $T_2$ | 801 | 770 | 763 | 651 | 654 |
| Mean | 782 | 756 | 716 | 654 | 727 |

C.D for M marginal means=70·8 Kg/ha.
C.D. for control vs. others =75·1 Kg/ha.

61(97)

(i) 464 Kg/ha. (ii) 47·6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=425 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $T_1$ | 483 | 453 | 484 | 446 | 466 |
| $T_2$ | 492 | 451 | 513 | 430 | 472 |
| Mean | 488 | 452 | 498 | 438 | 469 |

62(79)

(i) 652Kg/ha. (ii) 89·4 Kg/ha. (iii) Main effect of T alone is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $T_1$ | 618 | 571 | 613 | 621 | 606 |
| $T_2$ | 729 | 721 | 664 | 734 | 712 |
| Mean | 674 | 646 | 638 | 678 | 659 |

C.D. for T marginal means=65·2 Kg/ha.

**63(103)**

(i) 1141 Kg/ha. (ii) 127·3 Kg/ha. (iii) Main effect of M alone is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=1049 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $T_1$ | 1192 | 1243 | 1072 | 1013 | 1130 |
| $T_2$ | 1207 | 1243 | 1018 | 1236 | 1176 |
| Mean | 1199 | 1243 | 1045 | 1124 | 1153 |

C.D. for M marginal means=131·4 Kg/ha.

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 60(111), 61(96), 62(78), 63(102).**

**Site :- Agri. College Farm, Dharwar.** **Type :- 'M'.**

Object: — To find out suitable placement method of application of fertilizer to Cotton in light soil.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Light red loamy (1960) ; Light red soil (1961 to 1963). (iii) 18.8.1960 ; 11.8.1961 ; 24.8.1962 ; 28.9.1963. (iv) (a) Ploughing and harrowing. (b) to (e) N.A. (v) N.A. (1960), Nil for 1961 to 1963. (vi) *Laxmi*. (vii) Unirrigated. (viii) Interculturing, weeding and spraying (ix) N.A. (x) 23.1.1961 to 20.2.1961 ; 1.1.1962 to 6.4.1962 ; 7 pickings for 1962 (dates N.A.) ; 5.2.1964 to 19.3.1964.

2. TREATMENTS :

All combinations of (1) and (2)+one control.

(1) 2 manurial treatments : $T_1$=33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ and $T_2$=50·4 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$.

(2) 4 methods of placement : $M_1$=By plough sole method 13 cm. deep about one week before sowing, $M_2$=To drop in the same line when the seed is sown by s.c.f. drill, $M_3$=To drop 4 cm. deeper than seed in the same line with s.c.f. drill and $M_4$=To drop 5 cm. deep and 5 cm. away from the seed line by s.c.f. drill.

S.c.f. drill means seed-cum-fertilizer drill.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×6·1 m. (b) 7·3 m.×4·9 m. (v) 91 cm.×61cm. (vi) Yes.

4. GENERAL :

(i) Growth below normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1959 to 1963. (b) No. (c) Nil (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent.

5. RESULTS :

**60(118)**

(i) 233 Kg/ha. (ii) 41·3 Kg/ha. (iii) Only control vs. others effect is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=193 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $T_1$ | 221 | 225 | 241 | 224 | 228 |
| $T_2$ | 261 | 259 | 245 | 224 | 247 |
| Mean | 241 | 242 | 243 | 224 | 238 |

C.D. for control vs. others treatments means=45·2 Kg/ha.

**61(96)**

(i) 264 Kg/ha. (ii) 63·5 Kg/ha. (iii) Only control vs. others effect is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=168 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $T_1$ | 276 | 222 | 361 | 245 | 276 |
| $T_2$ | 211 | 345 | 233 | 317 | 276 |
| Mean | 243 | 284 | 297 | 281 | 276 |

C.D. for control vs. others treatment means=69·5 Kg/ha.

62(78)

(i) 418 Kg/ha. (ii) 109·0 Kg/ha. (iii) None of the effects is signifieant. (iv) Av. yield of *kapas* in Kg/ha.

Control=423 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $T_1$ | 399 | 365 | 490 | 402 | 414 |
| $T_2$ | 489 | 344 | 418 | 431 | 420 |
| Mean | 444 | 355 | 454 | 416 | 417 |

63(102)

(i) 71 Kg/ha. (ii) 19·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=51 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $T_1$ | 83 | 60 | 82 | 54 | 70 |
| $T_2$ | 63 | 85 | 78 | 83 | 77 |
| Mean | 73 | 73 | 80 | 68 | 74 |

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 62(66).**

**Site :- Agri. College Farm, Dharwar.** **Type :- 'M'.**

Object :— To find the optimum time of application of N to Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*. (b) *Jowar*. (c) N.A. (ii) Medium black. (iii) 5.9.62. (iv) (a) 3 ploughings and 3 harrowings. (b) Dibbling. (c) to (e) N.A. (v) 28·0 Kg/ha. of $K_2O$+28·0 Kg/ha. of $P_2O_5$. (vi) Jayadhar. (vii) Unirrigated. (viii) 3 weedings and 3 interculturings. (ix) 32 cm. (x) 15.3.63 to 12.4.63.

2. TREATMENTS :

All combinations of (1) and (2)+control (2 plots/replication).

(1) 2 levels of N as A/S : $N_1=28$ and $N_2=56$ Kg/ha.

(2) 6 times of application of N : $T_1$=At sowing, $T_2$=At thinning, $T_3$=At flowering, $T_4=\frac{1}{2}$ dose at sowing+$\frac{1}{2}$ dose at thinning, $T_5=\frac{1}{2}$ dose at sowing+$\frac{1}{2}$ dose at flowering and $T_6=\frac{1}{2}$ dose at thinning+$\frac{1}{2}$ dose at flowering.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 14. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 5·5 m.×3·7 m. (v) 2 rows alround. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1962—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 702 Kg/ha. (ii) 57·9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=684 Kg/ha.

| | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 709 | 712 | 677 | 702 | 761 | 702 | 710 |
| $N_2$ | 708 | 666 | 659 | 774 | 690 | 697 | 699 |
| Mean | 708 | 689 | 668 | 738 | 726 | 700 | 705 |

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**Crop :- Cotton.** **Ref :- Ms. 63(138).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'M'.**

Object :— To determine the suitable dose and time of application for Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 62·8 Q/ha. of F.Y.M. (ii) Deep black cotton soil. (iii) 16.8.63. (iv) 2 ploughing and cross ploughing harrowing, levelling and opening furrows. (b) Dibbled in furrows. (c) 9 Kg/ha. (d) 60 cm. between rows. (e) 2. (v) 62·8 Q/ha. of F.Y.M. (vi) Jayadhar. (vii) Unirrigated. (viii) 3 interculturing and 3 weedings. (ix) 50 cm. (x) 24.3.64.

2. TREATMENTS :

Same as in expt. no. 62(60) on page 371. Source of N : N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 3. (iv) (a) 4·8 m.×10·3 m. (b) 2·4 m.×7·9 m. (v) 120 cm.×120 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1962—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 726 Kg/ha. (ii) 119·2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=687 Kg/ha.

| | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 714 | 724 | 637 | 792 | 712 | 757 | 722 |
| $N_2$ | 661 | 835 | 671 | 790 | 771 | 719 | 741 |
| Mean | 687 | 779 | 654 | 791 | 741 | 738 | 732 |

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**Crop :- Cotton (*Kharif*).** **Ref :- Ms. 61(155), 62(69).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'M'.**

Object :— To find out the effect of seed treatmen ton the growth and yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) Nil. (ii) Medium black. (iii) 3.8.1961 ; 23.8.62. (iv) (a) 2 ploughings and 3 harrowings. (b) Dibbling in furrows. (c) 9 Kg/ha. (d) 60 cm. between rows. (e) 2. (v) 44·8 Kg/ha. of F.Y.M. for 61(155) and Nil for other. (vi) *Laxmi*. (vii) Unirrigated. (viii) Weeding for 61(155) ; 3 weedings and 3 interculturings for other. (ix) 19 cm. ; 6 cm. (x) 18 to 23.4.62 ; 18.3.63 to 15.4.63.

2. TREATMENTS :

4 seed treatments : $T_0$=Control, $T_1$=5·6 Kg/ha. of $P_2O_5$ as Super, $T_2$=5·6 Kg/ha. of potash and $T_3$= 3·4 Kg/ha. of lime.

Seeds treated with the fertilizer and mixed with 44·8 Kg/ha. of F.Y.M. before sowing.

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 11·5 m.×6·1 m. ; N.A. (b) 9·1 m.×3·7 m. ; 9·8 m×8·5 m. (v) 120 cm.×120 cm. ; two rows on all sides. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1961—1962. (b) No. (c) Nil. (v) Gadag. (vi) Nil. (vii) Error variances are heterogeneous and Treatments×years interaction is absent.

5. RESULTS :

**61(155)**

(i) 481 Kg/ha. (ii) 51·8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av. yield | 488 | 468 | 479 | 490 |

**62(69)**

(i) 249 Kg/ha. (ii) 32·1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av. yield | 253 | 256 | 252 | 237 |

**Crop :- Cotton.** **Ref :- Ms. 63(139), 64(212), 65(116).**
**Site :- Agri. Res. Stn., Gadag.** **Type :- 'M'.**

Object :— To study the effect of foliar vs. soil application of fertilizers and the effect of harmones.

1. BASAL CONDITIONS:

(i) (a) *Jowar*—Cotton in 1963 ; *Jowar*—Gram—Cotton in 1964 and 1965. (b) *Jowar* in 1963 ; Gram in 1964 and 1965. (c) 62·8 Q/ha. of F.Y.M. in 1963 ; 12·4 C.L./ha. of F.Y.M. in 1964 and 1965. (ii) Medium black cotton soil. (iii) 26.9.1963 ; 25.9.1964 ; N.A. (iv) (a) 2 ploughings and cross ploughing, levelling and opening furrows in 1963 ; 2 wooden ploughings and 2 harrowings in 1964 and 1965. (b) Dibbled in furrows. (c) 11·2 Kg/ha. (d) 61 cm.×31 cm. (e) 1. (v) 62·8 Q/ha. of F.Y.M. in 1963 ; Nil in 1964 and 1965. (vi) *Laxmi.* (vii) Unirrigated. (viii) 4 intercultivations and 3 weedings in 1963 ; 3 weedings in 1964 and 1965. (ix) 23 cm. ; 36 cm. ; N.A. (x) 23.2.1964 to 18.3.1964 ; 8.3.1965 to 8.4.1965. ; N.A.

2. TREATMENTS :

**Main-plot treatments**:

All combinations of (1) and (2)+a control.

(1) 2 levels of N as A/S : $N_1=5·6$ and $N_2=11·2$ Kg/ha.
(2) 3 methods of application of N : $M_1$=Soil application, $M_2$=Foliar application and $M_3=\frac{1}{2}$ soil application+$\frac{1}{2}$ foliar application.

**Sub-plot treatments** :

(1) 2 levels of harmones : $H_1$=NAA at 10 pp.m. and $H_2$=NAA at 20 pp.m.
(2) 2 times of application of harmones : $T_1$=4—5 leaf stage and $T_2$=At flowering.

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. in 1963 ; 7·3 m.×6·4 m. in 1964 and 1965. (b) 9·1 m.×4·9 in 1963 ; 6·1 m.×5·8 m. in 1964 and 1965. (v) 2 rows alround. (vi) Yes.

4. GENERAL :

(i) Normal in 1963 ; Good in 1964 and 1965. (ii) Nil in 1963, Endrin sprayed in 1964 to 1965. (iii) Yield of *kapas*. (iv) (a) 1962 to 1966 (1962—N.A.) (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

**63(139)**

(i) 517 kg/ha. (ii) (a) 107·8 Kg/ha. (b) 100·3 Kg/ha. (iii) Main effect of M and Control vs. others are significant. (iv) Av. yield of *kapas* in Kg/ha.

Control

| | $H_1$ | $H_2$ | Mean |
|---|---|---|---|
| $T_1$ | 475 | 409 | 442 |
| $T_2$ | 480 | 465 | 472 |
| Mean | 477 | 437 | 457 |

| | $N_1$ | $N_2$ | $H_1$ | $H_2$ | $T_1$ | $T_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $M_1$ | 585 | 561 | 581 | 565 | 592 | 554 | 573 |
| $M_2$ | 497 | 501 | 489 | 508 | 520 | 478 | 499 |
| $M_3$ | 504 | 513 | 471 | 546 | 486 | 531 | 508 |
| Mean | 529 | 525 | 514 | 540 | 533 | 521 | 527 |
| $T_1$ | 549 | 516 | 535 | 530 | | | |
| $T_2$ | 508 | 534 | 493 | 549 | | | |
| $H_1$ | 509 | 518 | | | | | |
| $H_2$ | 548 | 531 | | | | | |

C.D. for M marginal means =56·6 Kg/ha.

C.D. for comparison of control vs. others=61·2 Kg/ha.

**64(212)**

(i) 628 Kg/ha. (ii) (a) 206·6 Kg/ha. (b) 131·6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control

| | $H_1$ | $H_2$ | Mean |
|---|---|---|---|
| $T_1$ | 594 | 475 | 534 |
| $T_2$ | 601 | 507 | 554 |
| Mean | 597 | 491 | 544 |

| | $N_1$ | $N_2$ | $H_1$ | $H_2$ | $T_1$ | $T_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $M_1$ | 600 | 686 | 624 | 662 | 638 | 648 | 643 |
| $M_2$ | 643 | 647 | 628 | 662 | 651 | 639 | 645 |
| $M_3$ | 662 | 615 | 628 | 649 | 660 | 617 | 638 |
| Mean | 635 | 649 | 627 | 658 | 650 | 635 | 642 |
| $T_1$ | 620 | 680 | 656 | 644 | | | |
| $T_2$ | 650 | 619 | 597 | 672 | | | |
| $H_1$ | 656 | 597 | | | | | |
| $H_2$ | 614 | 702 | | | | | |

**65(116)**

(i) 1478 Kg/ha. (ii) (a) 2858·0 Kg/ha. (b) 1116·2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control

| | $H_1$ | $H_2$ | Mean |
|---|---|---|---|
| $T_1$ | 1845 | 1890 | 1864 |
| $T_2$ | 2240 | 1787 | 2014 |
| Mean | 2043 | 1839 | 1941 |

| | $N_1$ | $N_2$ | $H_1$ | $H_2$ | $T_1$ | $T_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $M_1$ | 924 | 771 | 822 | 873 | 864 | 831 | 847 |
| $M_2$ | 774 | 954 | 812 | 915 | 848 | 879 | 864 |
| $M_3$ | 2263 | 2716 | 2598 | 2381 | 2505 | 2475 | 2490 |
| Mean | 1320 | 1480 | 1411 | 1390 | 1406 | 1395 | 1400 |
| $T_1$ | 1165 | 1646 | 1217 | 1594 | | | |
| $T_2$ | 1476 | 1314 | 1604 | 1186 | | | |
| $H_1$ | 1122 | 1700 | | | | | |
| $H_2$ | 1519 | 1260 | | | | | |

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**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 60(159), 61(146).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'M'.**

Object :—To find out the effect on the growth and yield of Cotton by the application of N and P.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) N.A. (ii) Medium black soil. (iii) 26.9.1960 ; 27.9.1961. (iv) (a) 2 ploughings and 2 to 4 harrowings ; Levelling and opening furrows. (b) Dibbling in furrows. (c) 9 Kg/ha. (d) 61 cm. between rows. (e) 2. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) 3 weedings. (ix) 25 cm. ; 17 cm. (x) 30.3.1961 ; 3.3.1962 to 5.4.1962.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N : $N_0=0$, $N_1=11{\cdot}2$, $N_2=22{\cdot}4$ and $N_3=33{\cdot}6$ Kg/ha.

(2) 4 levels of $P_2O_5$ : $P_0=0$, $P_1=28{\cdot}0$, $P_2=56{\cdot}0$ and $P_3=84{\cdot}0$ Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Yield of *kapas*. (iv) (a) 1959-61. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Error variances are heterogeneous. Treatments × years interaction is absent.

5. RESULTS :

**60(159)**

(i) 420 Kg/ha. (ii) 60·7 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | Mean |
|---|---|---|---|---|---|
| $P_0$ | 403 | 457 | 389 | 487 | 434 |
| $P_1$ | 351 | 450 | 396 | 439 | 409 |
| $P_2$ | 374 | 401 | 392 | 458 | 406 |
| $P_3$ | 433 | 396 | 427 | 564 | 430 |
| Mean | 390 | 426 | 401 | 462 | 420 |

C.D. for N marginal means=43·3 Kg/ha.

**61(146)**

(i) 496 Kg/ha. (ii) 125·0 Kg/ha. (iii) Main effect of P alone is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | Mean |
|---|---|---|---|---|---|
| $P_0$ | 537 | 355 | 291 | 529 | 438 |
| $P_1$ | 413 | 540 | 474 | 514 | 485 |
| $P_2$ | 493 | 474 | 596 | 525 | 522 |
| $P_3$ | 519 | 535 | 620 | 529 | 551 |
| Mean | 490 | 476 | 495 | 524 | 496 |

C.D. for P marginal means=89·1 Kg/ha.

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**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 61(140), 62(71).**

**Site :- Agri. Res. Stn., Gadag.** **Type :-'M'.**

Object :—To find out the effect of seed treatment on growth and yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) Nil. (ii)Medium black cotton soil. (iii) 6.10.1961 ; 21.9.1962. (iv) (a) 2 to 3 ploughings and 3 to 4 harrowings. (b) Dibbled in plough furrows. (c) 9 Kg/ha. (d) 61 cm. between rows. (e) 2. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) 3 weedings. (ix) 15 cm. ; 39 cm. (x) 4 to 29.3.1962 ; 24.2.1962 to 31.3.1963.

2. TREATMENTS :

4 seed treatments : $T_0$=Control, $T_1$=5·6 Kg/ha. of phosphoric acid as Super, $T_2$=5·6 Kg/ha. af Potash and $T_3$=3·4 Kg/ha. of Lime.

Seeds treated with above were mixed with 44.8 Kg/ha. of F.Y.M. before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 17·1 m.×6·1 m. (v) 2 rows alround. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1961-62. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variançes are homogeneous. Treatments×years interaction is absent.

5. RESULTS :

(i) 432 Kg/ha. (ii) 48·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av. yield | 445 | 416 | 452 | 413 |

| Years | $T_0$ | $T_1$ | $T_2$ | $T_3$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|
| 1960 | 556 | 497 | 549 | 485 | ** | 522 | 42·8 |
| 1961 | 335 | 335 | 355 | 341 | N.S. | 342 | 50·7 |
| Pooled | 445 | 416 | 452 | 413 | N.S. | 432 | 48·2 |

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**Crop :- Cotton.** **Ref :- Ms. 60(152).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'M'.**

Object :—To study the effect of application of N, P and K on the growth and yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) Nil. (ii) Medium black cotton soil. (iii) 27.9.1960. (iv) (a) 2 ploughings, 3 harrowings. (b) Dibbling in furrows. (c) 9 Kg/ha. (d) 61 cm. between rows. (e) 2. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) weeding. (ix) N.A. (x) 24.1.1961 to 24.2.1961.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=22·4$ and $N_2=44·8$ Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_0=0$, $P_1=168$ and $P_2=336$ Kg/ha.
(3) 3 levels of $K_2O$ as Potash : $K_0=0$, $K_1=112$ and $K_2=224$ Kg/ha.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) and (b) N.A. (v) 2 rows on all side. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1952-N.A. (b) No. (c) Nil. (v) Dharwar. (vi) N.A. (vii) Nil.

5. RESULTS :

(i) 375 Kg/ha. (ii) 57·6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *Kapas* in Kg/ha.

|  | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 369 | 370 | 358 | 366 | 353 | 378 | 366 |
| $N_1$ | 383 | 379 | 385 | 381 | 389 | 376 | 382 |
| $N_2$ | 394 | 358 | 380 | 345 | 388 | 399 | 377 |
| Mean | 382 | 369 | 374 | 364 | 377 | 384 | 375 |
| $K_0$ | 365 | 351 | 375 |  |  |  |  |
| $K_1$ | 397 | 391 | 343 |  |  |  |  |
| $K_2$ | 384 | 364 | 405 |  |  |  |  |

**Crop :- Cotton.** **Ref :- Ms. 60(155), 60(156).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'M'.**

Object :—To find out the residual effect of N, P and K applied during 1957-58 on *Laxmi* Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton after cotton. (b) Cotton. (c) Nil. (ii) Medium black. (iii) 5.10.1960 ; N.A. (iv) (a) 3 ploughings and 3 harrowings. (b) Dibbled in furrows. (c) 9 Kg/ha. (d) 61 cm. between rows. (e) 2. (v) Nil. (vi) *Laxmi* ; M.A.—5. (vii) Unirrigated. (viii) weeding. (ix) 25 cm. ; N.A. (x) 28.3.1961 ; N.A.

2. TREATMENTS :

Same as in expt. no. 60(152) on page 378.
Fertilizers applied during the year 1957-58. Residual effect being studied.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) and (b) N.A. (v) 2 rows alround. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1958 to 60. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**60(156). (Variety M.A.—5).**

(i) 460 Kg/ha. (ii) 122·5 Kg/ha. (iii) Main effect of P alone is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 383 | 460 | 507 | 447 | 507 | 396 | 450 |
| $N_1$ | 397 | 507 | 569 | 573 | 415 | 485 | 491 |
| $N_2$ | 251 | 514 | 554 | 459 | 441 | 419 | 440 |
| Mean | 344 | 493 | 543 | 493 | 454 | 433 | 460 |
| $K_0$ | 443 | 455 | 581 | | | | |
| $K_1$ | 328 | 504 | 531 | | | | |
| $K_2$ | 261 | 521 | 518 | | | | |

C.D. for P marginal means=84·8 Kg/ha.

**60(155). (Variety *Laxmi*)**

(i) 662 Kg/ha. (ii) 125·7 Kg/ha. (iii) Main effect of P alone is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 559 | 677 | 736 | 655 | 679 | 638 | 657 |
| $N_1$ | 560 | 669 | 723 | 712 | 623 | 617 | 651 |
| $N_2$ | 615 | 731 | 689 | 684 | 709 | 642 | 678 |
| Mean | 578 | 692 | 716 | 684 | 670 | 632 | 662 |
| $K_0$ | 577 | 694 | 781 | | | | |
| $K_1$ | 609 | 699 | 703 | | | | |
| $K_2$ | 547 | 684 | 665 | | | | |

C.D. for P marginal means=86·8 Kg/ha.

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**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 60(157).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Cotton, mixed with F.Y.M.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) Nil. (ii) Medium black soil. (iii) 12.9.60. (iv) (a) 2 ploughings, 2 harrowings. (b) Dibbled in furrows. (c) 9 Kg/ha. (d) 61 cm. (e) 2. (v) F.Y.M. at the time of sowing (Quantity N.A). (vi) *Laxmi*. (vii) Unirrigated. (viii) 4 weedings, 2 interculturings. (ix) 41 cm. (x) 31.3.61.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 2 levels of N : $N_0$=0 and $N_1$=56 Kg/ha.
(2) 2 levels of $P_2O_5$ : $P_0$=0 and $P_1$=56 Kg/ha.
(3) 2 levels of $K_2O$ : $K_0$=0 and $K_1$=56 Kg/ha.

3. DESIGN :

(i) $2^3$ Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) N.A. (v) 2 rows alround. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 284 Kg/ha. (ii) 83·9 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $K_0$ | $K_1$ | Mean |
|---|---|---|---|---|---|
| $N_0$ | 243 | 242 | 253 | 232 | 242 |
| $N_1$ | 324 | 329 | 329 | 324 | 326 |
| Mean | 283 | 285 | 291 | 278 | 284 |
| $K_0$ | 299 | 283 | | | |
| $K_1$ | 268 | 288 | | | |

C.D. for N marginal means=49·2 Kg/ha.

**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 60(153).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'M'.**

Object :—To find out the effect of N, P and K on the yield and growth of Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) Nil. (ii) Medium black cotton soil. (iii) 12.9.60. (iv) (a) 3 ploughings and 3 harrowings. (b) Dibbled in furrows. (c) 9 Kg/ha. (d) 61 cm. between rows. (e) 2. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) Weeding. (ix) Nil. (x) 17.2.61 to 30.3.61.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 levels of N : $N_0=0$ and $N_1=33{\cdot}6$ Kg/ha.
(2) 2 levels of $P_2O_5$ : $P_0=0$ and $P_1=67{\cdot}2$ Kg/ha.
(3) 2 levels of $K_2O$ : $K_0=0$ and $K_1=33{\cdot}6$ Kg/ha.

3. DESIGN :

(i) $2^3$ Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 7·3 m.×7·3 m. (v) 2 rows alround. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 284 Kg/ha. (ii) 84·9 Kg/ha. (iii) N×P×K interaction alone is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $K_0$ | $K_1$ | Mean |
|---|---|---|---|---|---|
| $N_0$ | 242 | 243 | 253 | 231 | 242 |
| $N_1$ | 324 | 327 | 328 | 324 | 326 |
| Mean | 283 | 285 | 290 | 278 | 284 |
| $K_0$ | 299 | 282 | | | |
| $K_1$ | 266 | 288 | | | |

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 61(141).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'M'.**

Object : – To find out the effect of applying manures on the growth and yield of Cotton on Ryots plot when bad boll opening had been observed during previous year.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) Nil. (ii) Medium black cotton soil. (iii) 29.9.61. (iv) (a) 2 ploughings and 4 harrowings. (b) Dibbled in plough furrows. (c) 9 Kg/ha. (d) 61 cm. between rows. (e) 2. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) 3 weedings. (ix) 18 cm. (x) 16.2.62 to 20.3.62.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 levels of N : $N_0=0$ and $N_1=33{\cdot}6$ Kg/ha.
(2) 2 levels of $P_2O_5$ : $P_0=0$ and $P_1=67{\cdot}2$ Kg/ha.
(3) 2 levels of $K_2O$ : $K_0=0$ and $K_1=67{\cdot}2$ Kg/ha.

3. DESIGN :

(i) $2^3$ Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 17·1 m. × 6·1 m. (v) 2 row alround. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) and (b) No. (c) Nil. (v) and (vi) Nil. (vii) Experiment conducted at Nalwad Ryots plot.

5. RESULTS :

(i) 126 Kg/ha. (ii) 57·7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $K_0$ | $K_1$ | Mean |
|---|---|---|---|---|---|
| $N_0$ | 143 | 114 | 142 | 115 | 128 |
| $N_1$ | 130 | 117 | 109 | 138 | 124 |
| Mean | 136 | 116 | 126 | 126 | 126 |
| $K_0$ | 135 | 111 | | | |
| $K_1$ | 137 | 115 | | | |

**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 61(148).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'M'.**

Object :—To find out the effect of application of N, P and K on the growth and yield of Cotton in Ryots plots when bad boll opening had occured during previous year.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) Nil. (ii) Medium black soil. (iii) 13.10.61. (iv) (a) 2 ploughings and 3 harrowings. (b) Dibbling in plough furrows. (c) 9 Kg/ha. (d) 61 cm. between rows. (e) 2. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) 3 weedings. (ix) 18 cm. (x) 22.3.62.

2. TREATMENTS : to 4. GENERAL :

Same as in expt. no. 61(141) on page 381.

5. RESULTS :

(i) 284 Kg/ha. (ii) 139·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $K_0$ | $K_1$ | Mean |
|---|---|---|---|---|---|
| $N_0$ | 248 | 262 | 287 | 223 | 255 |
| $N_1$ | 289 | 337 | 303 | 323 | 313 |
| Mean | 269 | 299 | 295 | 273 | 284 |
| $K_0$ | 250 | 340 | | | |
| $K_1$ | 288 | 259 | | | |

**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 61(147).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'M'.**

Object :— To find out the residual effect of manures applied during the previous year on growth and yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*. (b) *Jowar*. (c) Nil. (ii) Medium black cotton soil. (iii) 27.9.61. (iv) (a) 2 ploughings and 4 harrowings. (b) Dibbled in furrows. (c) 9 Kg/ha. (d) 61 cm. between rows. (e) 2. (v) Nil. (vi) Laxmi. (vii) Unirrigated. (viii) 3 weedings. (ix) 18 cm. (x) 4.3.62 to 4.4.62.

2. TREATMENTS :

All combinations of (1), (2) and (3).

(1) 2 levels of N : $N_0$=0 and $N_1$=33·6 Kg/ha.
(2) 2 levels of $P_2O_5$ : $P_0$=0 and $P_1$=56·0 Kg/ha.
(3) 2 levels of $K_2O$ : $K_0$=0 and $K_1$=56·0 Kg/ha.

3. DESIGN :

(i) $2^3$ Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 8·5 m.×7·3 m. (v) 2 rows all round. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) N.A (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 255 Kg/ha. (ii) 71·6 Kg/ha. (iii) The interaction N×P×K is highly significant and interaction N×P is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $K_0$ | $K_1$ | Mean |
|---|---|---|---|---|---|
| $N_0$ | 217 | 232 | 241 | 208 | 225 |
| $N_1$ | 238 | 334 | 281 | 291 | 286 |
| Mean | 228 | 283 | 261 | 250 | 255 |
| $K_0$ | 242 | 279 | | | |
| $K_1$ | 213 | 286 | | | |

C.D. for body of N×P table=59·0 Kg/ha.

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 60(158), 61(149).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'M'**

Object :— To find out the effect on growth and yield of Cotton by applying different combinations of N, P and K.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) Nil. (ii) Medium black soil. (iii) 27.9.1960 ; 26.9.1961. (iv) (a) 2 ploughings, 2 to 4 harrowings, levelling and opening furrows. (b) Dibbled in furrows. (c) 9 Kg/ha. (d) 61 cm. between rows. (e) 2. (v) Nil. (vi) Laxmi. (vii) Unirrigated. (viii) 3 weedings. (ix) 25 cm. ; 17 cm. (x) 31.3.1961 ; 3.3.1962 to 4.4.1962.

### 2. TREATMENTS :

All combinations of (1), (2) and (3).

(1) 3 levels of N : $N_0=0$, $N_1=16{\cdot}8$ and $N_2=33{\cdot}6$ Kg/ha.
(2) 3 levels of $P_2O_5$ : $P_0=0$, $P_1=28{\cdot}0$ and $P_2=56{\cdot}0$ Kg/ha.
(3) 3 levels of $K_2O$ : $K_0=0$, $K_1=28{\cdot}0$ and $K_2=56{\cdot}0$ Kg/ha.

### 3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 14·0 m. × 3·7 m. (v) and (vi) Yes.

### 4. GENERAL :

(i) Normal. (ii) Nil. (iii) *Kapas* yield and no. of flowers and bulbs/plant. (iv) (a) 1959—N.A. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous. Treatments × years interaction is absent.

### 5. RESULTS :

**60(158)**

(i) 372 Kg/ha. (ii) 57·9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 369 | 364 | 345 | 366 | 347 | 366 | 360 |
| $N_1$ | 383 | 379 | 384 | 380 | 389 | 376 | 382 |
| $N_2$ | 389 | 358 | 380 | 347 | 381 | 399 | 376 |
| Mean | 380 | 367 | 370 | 364 | 372 | 380 | 372 |
| $K_0$ | 367 | 351 | 375 | | | | |
| $K_1$ | 390 | 385 | 343 | | | | |
| $K_2$ | 385 | 364 | 392 | | | | |

**61(149)**

(i) 441 Kg/ha. (ii) 92·3 Kg/ha. (iii) P effect alone is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 392 | 451 | 427 | 418 | 436 | 415 | 423 |
| $N_1$ | 396 | 444 | 457 | 415 | 437 | 445 | 432 |
| $N_2$ | 426 | 453 | 520 | 455 | 482 | 462 | 466 |
| Mean | 405 | 449 | 468 | 429 | 452 | 441 | 441 |
| $K_0$ | 382 | 427 | 479 | | | | |
| $K_1$ | 419 | 487 | 449 | | | | |
| $K_2$ | 413 | 433 | 477 | | | | |

C.D. for P marginal means=45·1 Kg/ha.

**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 62(122).**

**Site :- Agri. Res. Stn., Naragund.** **Type :- 'M'.**

Object ;— To find out the best method of application of sulphur to improve the local soil.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) Alkaline. (iii) 14.9.62. (iv) (a) Harrowing by blade harrow. (b) Dibbling. (c) N.A. (d) 46 cm. between rows. (e) N.A. (v) Nil. (vi) *Jayadhar* (medium). (vii) Unirrigated. (viii) 2 interculturings by entire hoe. (ix) 82 cm. (x) 1, 19.3.63.

2. TREATMENTS :

3 methods of application of sulphur at 125·5 Kg/ha. : $M_0$=Control (no sulphur), $M_1$=Broadcasting and $M_2$=Applied at the time of sowing with seeds by spot application.

3. DESIGN ;

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 6·0 m.×6·0 m. (b) 5·0 m.×5·0 m. (v) 46 cm.×46 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Plant height, boll count and yield of *kapas*. (iv) (a) 1961—contd. (modified in 1963). (b) Yes. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 179 Kg/ha. (ii) 36·6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ |
|---|---|---|---|
| Av. yield | 171 | 190 | 175 |

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**Crop :- Cotton (*Rabi*).** **Ref:- Ms. 63(108), 64(92).**

**Site :- Agri. Res. Stn., Naragund.** **Type :- 'M'.**

Object :— To find out the effect of sulphur and F.Y M. in increasing the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Nil (1963). As per treatments (1964). (ii) Alkaline. (iii) 4.10 1963 ; 22.9.1964. (iv) (a) Harrowing by blade harrow. (b) Dibbling. (e) N.A. (d) 46 cm. between rows. (e) 2. (v) Nil. (vi) *Jaaydhar* (medium). (vii) Unirrigated. (viii) 2 interculturings by entire hoe. (ix) N.A. ; 58 cm. (x) 14, 28.3.1964 and 10.4.1964 ; 8.3.1965 to 8.4.1965.

2. TREATMENTS ;

3 manurial treatments : $M_0$=Control (no manure), $M_1$=12·4 C.L./ha. of F.Y.M.+125·5 Kg/ha. of sulphur broadcasted, $M_2$=As $M_1$ but sulphur by spot application.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 6·9 m.×5·9 m. (b) 5·0 m.×5·0 m. (v) 46 cm.×46 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Plant height, boll count and *kapas* yield. (iv) (a) 1961—contd. (modified in 1963). (b) Yes. (c) As under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous.

5. RESULTS :

(i) 442 Kg/ha. (ii) 117·3 Kg/ha. (based on 30 d.f. made up of pooled error and Treatments × years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ |
|---|---|---|---|
| Av. yield | 390 | 472 | 465 |

| Years | $M_0$ | $M_1$ | $M_2$ | Sig. | G.M. | S.E./plot. |
|---|---|---|---|---|---|---|
| 1963 | 348 | 430 | 429 | N.S. | 403 | 90·9 |
| 1964 | 431 | 513 | 501 | N.S. | 482 | 145·6 |
| Pooled | 390 | 472 | 465 | N.S. | 442 | 117·3 |

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 63(111), 64(90).**

**Site :- Agri. Res. Stn., Naragund.** **Type :- 'M'**

Object : —To find out suitable method of application of N and P fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Nil ; As per treatments. (ii) Alkaline. (iii) 3.10.1963. ; 17.10.1964. (iv) (a) Harrowing by blade harrow. (b) Dibbling. (c) N.A. (d) 76 cm. × 76 cm. (e) 2. (v) Nil. (vi) *Jayadhar* (medium). (vii) Unirrigated. (viii) 2 hand weedings (1963, 1964) ; 3 interculturings (1964). (ix) 58 cm. ; N.A. (x) 3,14 and 29.3.1964 ; 19.3.1965 and 8.4.1965.

2. TREATMENTS :

6 methods of application of 16·8 Kg/ha. of N+16·8 Kg/ha. of $P_2O_5$ : $M_0$=ploughing only, $M_1$=Broadcast (normal application), $M_2$=Deep placement of 2/3 of mixture of N and P behind the iron plough (M.B. removed) and ⅓ at sowing time by usual method, $M_3$=2/3 dose by deep placement behind the plough and ⅓ dose as top dressing 2 to 3 weeks after germination of seeds, $M_4$=2/3 dose by deep placement and ⅓ dose by spraying twice (i) 20 days after germination and (ii) at flowering stage and $M_5$=⅓ dose by deep placement and 2/3 dose by spraying as in $M_4$.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 8·8 m. × 7·6 m. (b) 7·3 m. × 6·1 m. (v) 76 cm. × 76 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Plant count, height and yield of *kapas*. (iv) (a) 1963 to 1964. (b) Yes. (c) As under 5. Results. (v) Bijapur and Bagalkot. (vi) Nil. (vii) Error varinaces are homogenous. Treatments × years interaction is absent.

5. RESULTS :

(i) 363 Kg/ha. (ii) 72·3 Kg/ha. (based on 35 d.f. made up of pooled error and Treatments × years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. Yield | 366 | 384 | 374 | 366 | 372 | 315 |

| | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | Sig. | G.M. | S.E./plot. |
|---|---|---|---|---|---|---|---|---|---|
| 1963 | 431 | 503 | 465 | 496 | 477 | 466 | N.S. | 473 | 71·6 |
| 1964 | 199 | 229 | 302 | 253 | 254 | 279 | N.S. | 253 | 77·5 |
| Pooled | 366 | 384 | 374 | 366 | 372 | 315 | N.S. | 363 | 72 3 |

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**Crop :- Cotton** (*Kharif*). **Ref :- Ms. 64(178).**

**Site :- Minor Res. Stn., Ranebennur.** **Type :- 'M'**

Object :—To study the effect of defferent levels and optimum time of application of N.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) (a) Medium black cotton soil. (iii) 25.6.1964. (iv) (a) 3 ploughing with wooden plough, harrowing with blade furrows. (b) Dibbling. (c) Nil. (d) 61 cm. × 30 cm. (e) 1. (v) 28 Kg/ha. of $P_2O_5$+28 Kg/ha. of $K_2O$. (vi) *Laxmi* (late). (vii) Unirrigated. (viii) weeding of interculturing. (ix) 60 cm. (x) 2.10.1964 to 9.3. 65.

2. TREATMENTS :

All combinations of (1) and (2)+control (2 plots).

(1) 2 levels of N : $N_1$=28 and $N_2$=56 Kg/ha.

(2) 6 times of application of N : $T_1$=Full dose at sowing, $T_2$=Full dose at thinning, $T_3$ =Full dose at flowering, $T_4$=$\frac{1}{2}$ dose at sowing +$\frac{1}{2}$ dose at thinning, $T_5$=$\frac{1}{2}$ dose at sowing +$\frac{1}{2}$ dose at flowering and $T_6$=$\frac{1}{2}$ dose at thinning+$\frac{1}{2}$ dose at flowering.

3. DESIGN :

(i) Fact. in R.B. D. (ii) (a) 14. (b) 36·6 m. × 51·2 m. (iii) 3. (iv) (a) 12·2 m. × 3·7 m. (b) 11·6 m. × 2·4 m. (v) 30 cm. × 65 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1964—N.A. (b) No. (c) Nil. (v) to (vii) N A.

5. RESULTS :

(i) 897 Kg/ha. (ii) 121·9 Kg/ha. (iii) Control vs. other treatments effect alone is highly significant. (iv) Av. yield of *Kapas* in Kg/ha.

Control=645 Kg/ha.

| | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 926 | 901 | 901 | 908 | 1021 | 962 | 937 |
| $N_2$ | 928 | 956 | 843 | 1098 | 898 | 928 | 942 |
| Mean | 927 | 931 | 872 | 1003 | 960 | 945 | 940 |

C.D. for control vs. others=110·5 Kg/ha.

**Crop :- Cotton.** **Ref :- 65(100).**

**Site :- Agri. Res. Stn., Saundathi.** **Type :- 'M'.**

Object :—To study the response of N and P at higher levels on the yield of *Laxmi* Cotton under dry farming condition.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*. (b) *Kharif Jowar*. (c) 33·6 Kg/ha. of A/S+22·4 Kg/ha. of Super applied at sowing. (ii) Medium black. (iii) 23.8.65. (iv) (a) Ploughing and harrowing 5 times. (b) Dibbling. (c) N.A. (d) 61 cm.×15 cm. (e) 2. (v) 5 C.L./ha. of F.Y.M.+ 5 Kg/ha. of Mur. Pot to all plots. (vi) *Laxmi*. (vii) Unirrigated. (viii) 5 interculturings and 2 hand weedings. (ix) 48 cm. (x) 25.12.65. to 11.3.66.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : $N_1$=22·4, $N_2$=33·6 and $N_3$=44·8 Kg/ha.
(2) 3 levels of $P_2O_5$ : $P_1$=11·2, $P_2$=16·8 and $P_3$=22·4 Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 14·3 m.×7·4 m. (b) 13·4 m.×6.1 m. (v) one row alround. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1965—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 594 Kg/ha. (ii) 95·8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_1$ | $P_2$ | $P_3$ | Mean |
|---|---|---|---|---|
| $N_1$ | 534 | 522 | 561 | 549 |
| $N_2$ | 570 | 609 | 616 | 598 |
| $N_3$ | 615 | 612 | 679 | 635 |
| Mean | 573 | 591 | 619 | 594 |

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**Crop :- Cotton. (*Rabi*).** **Ref :- Ms. 60(104), 61(80), 62(92), 63(91), 64(63).**

**Site :- Agri. Res. Stn., Saundathi.** **Type :- 'M'.**

Object :—To find out the N, P and K requirements of Cotton in the dry tract.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M. (ii) Medium black. (iii) 19.8.1960 ; 25.8.1961 ; 21.8.1962 ; 29.8.1963 ; 21.8.1964. (iv) (a) 4 harrowings in 1960 ; iron ploughing and 3 harrowings in other years. (b) Dibbling. (c) 11 Kg/ha. (d) 61 cm.×15 to 18 cm. (e) N.A. (v) Nil. (vi) *Jayadhar*. (vii) Unirrigated. (viii) 4 interculturings with hoe and 1 to 2 hand weedings. (ix) 32 cm. ; 21 cm. ; 43 cm. ; 21 cm. ; 37 cm. (x) 26.2.1961 ; 9.3.1962 to 8.4.1962 ; 25.2.1963 ; 1.2.64 ; 2.3.65.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : $N_0$=0, $N_1$=22·4 and $N_2$=44.8 Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_0$=0, $P_1$=16·8 and $P_2$=33·6 Kg/ha.
(3) 3 levels of $K_2O$ as Mur. Pot. : $K_0$=0, $K_1$=16·8 and $K_2$=33·6 Kg/ha.

## 3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) 49·4 m.×14.0 m. (iii) 2. (iv) (a) 14·0 m. ×5·5 m. (b) 12·2 m.×4.3 m. (v) 91 cm.×61 cm. (vi) Yes.

## 4. GENERAL:

(i) Satisfactory (1960, 61 and 63). Fairly Normal (1964). Crop suffered due to unfavourable cloudy week in 1962. (ii) Attack of semi loopes cotton piller. Folidol 0·04% sprayed in 1960. Nil for other years. (iii) Plant height, count and *kapas* yield. (iv) (a) 1960– contd. (b) No. (c) As under 5. Results. (v) Nil. (vi) Cotton crop unfavourably affected by weather conditions in 1961. Nil in other years. (vii) Error variances are heterogeneous. Treatments×years interaction is absent.

## 5. RESULTS :

**60(104)**

(i) 482 Kg/ha. (ii) 51·1 Kg/ha. (iii) Main effects of N alone is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 380 | 429 | 416 | 406 | 399 | 420 | 408 |
| $N_1$ | 494 | 509 | 496 | 491 | 503 | 506 | 500 |
| $N_2$ | 534 | 567 | 516 | 546 | 536 | 535 | 539 |
| Mean | 469 | 502 | 476 | 481 | 479 | 487 | 482 |
| $K_0$ | 454 | 507 | 482 | | | | |
| $K_1$ | 473 | 492 | 473 | | | | |
| $K_2$ | 481 | 507 | 473 | | | | |

C.D. for N marginal means=35·3 Kg/ha.

**61(80)**

(i) 211 Kg/ha. (ii) 39·0 Kg/ha. (iii) Main effect of N is highly significont. Interaction P×K is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 144 | 165 | 144 | 132 | 165 | 157 | 151 |
| $N_1$ | 250 | 226 | 193 | 219 | 209 | 240 | 223 |
| $N_2$ | 247 | 254 | 278 | 250 | 252 | 277 | 260 |
| Mean | 214 | 215 | 205 | 200 | 209 | 225 | 211 |
| $K_0$ | 216 | 220 | 164 | | | | |
| $K_1$ | 214 | 187 | 225 | | | | |
| $K_2$ | 211 | 239 | 225 | | | | |

C.D. for N marginal means=26·9 Kg/ha.
C.D. for body of N×K table=46.6 Kg/ha.

**62(92)**

(i) 332 Kg/ha. (ii) 31·2 Kg/ha. (iii) Main efiects of N and P are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 267 | 299 | 254 | 276 | 255 | 289 | 273 |
| $N_1$ | 314 | 348 | 337 | 336 | 321 | 341 | 333 |
| $N_2$ | 367 | 420 | 382 | 403 | 401 | 364 | 389 |
| Mean | 316 | 355 | 324 | 338 | 326 | 331 | 332 |
| $K_0$ | 304 | 356 | 355 | | | | |
| $K_1$ | 314 | 349 | 314 | | | | |
| $K_2$ | 330 | 360 | 304 | | | | |

C.D. for N or P marginal means=21·5 Kg/ha.

63(91)

(i) 438 Kg/ha. (ii) 17·8 Kg/ha. (iii) Main effect of N and interaction P×K are highly significant. Main effect of P and K are significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 365 | 370 | 351 | 353 | 364 | 368 | 362 |
| $N_1$ | 465 | 465 | 436 | 456 | 452 | 456 | 455 |
| $N_2$ | 493 | 496 | 504 | 483 | 488 | 521 | 498 |
| Mean | 441 | 443 | 430 | 431 | 435 | 449 | 438 |
| $K_0$ | 445 | 446 | 402 | | | | |
| $K_1$ | 430 | 422 | 453 | | | | |
| $K_2$ | 448 | 462 | 436 | | | | |

C. D. for N, P or K marginal means=12.3 Kg/ha.
C. D. for body of P×K table=21·4 Kg/ha.

64(63)

(i) 354 Kg/ha. (ii) 46·2 Kg/ha. (iii) Main effect of N is highly significant. Interaction P×K is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 250 | 267 | 266 | 247 | 265 | 270 | 261 |
| $N_1$ | 358 | 374 | 379 | 356 | 362 | 393 | 370 |
| $N_2$ | 406 | 474 | 416 | 464 | 408 | 424 | 432 |
| Mean | 338 | 372 | 354 | 356 | 345 | 362 | 354 |
| $K_0$ | 305 | 409 | 354 | | | | |
| $K_1$ | 332 | 348 | 355 | | | | |
| $K_2$ | 377 | 358 | 352 | | | | |

C. D. for N marginal means =31·9 Kg/ha.
C. D. for body of P×K table=55·3 Kg/ha.

**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 60(94), 61(261).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'M'.**

Object :—To find out the optimum dose of N, P and K to get more yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*. (b) *Jowar*. (c) 125·6 Q/ha. of F.Y.M.+44·8 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super in 1960; N.A. in 1961. (ii) Black soil. (iii) 8.9.1960; 1.9.1961. (iv) (a) 2 ploughings with victory plough, harrowing and ridging. (b) Dibbling. (c) N.A. in 1960 ; 12·4 Kg/ha. in 1961. (d) 69 cm. × 23 cm. (e) N.A. (v) 125·6 Q/ha. of F.Y.M. in 1960 ; 113·8 Q/ha. of F.Y.M in 1961. (vi) *Laxmi*. (vii) Irrigated. (viii) weedings and interculturing. (ix) 28 cm ; 42 cm. (x) 28.2.1961 to 28.3.1963; 2.4.1962.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N : $N_0$=0, $N_1$=33·6 and $N_2$=67·2 Kg/ha.
(2) 3 levels of $P_2O_5$ : $P_0$=0, $P_1$=33·6 and $P_2$=67·2 Kg/ha.
(3) 3 levels of $K_2O$ : $K_0$=0, $K_1$=33·6 and $K_2$=67·2 Kg/ha.

Time and method of application of fertilizers in 1960 N.A. In 1961, fertilizers applied in furrows. N applied in 2 equal doses—half at the time of sowing along with total amount of P and K. Remaining N was applied after 30 days of sowing.

3. DESIGN :

(i) $3^3$ partially confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 1/124 ha, in 1960 ; 7·4 m.×6·9 m. in 1961. (b) 1/165 ha. in 1960 ; 5·5 m.×5·5 m. in 1961. (v) N.A. in 1960 ; one row on each side in 1961. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Severe attack of Jassids in 1960 ; Nil in 1961. (iii) Yield of *kapas*. (iv) (a) 1960 to 61 N.A. (b) No. (c) As under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous. Treatments × years interaction is absent.

5. RESULTS :

60(94)

(i) 1328 Kg/ha. (ii) 148·5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 1278 | 1320 | 1374 | 1378 | 1292 | 1303 | 1324 |
| $N_1$ | 1273 | 1411 | 1295 | 1385 | 1224 | 1371 | 1327 |
| $N_2$ | 1351 | 1300 | 1344 | 1238 | 1372 | 1385 | 1332 |
| | 1301 | 1344 | 1338 | 1334 | 1296 | 1353 | 1328 |
| $K_0$ | 1295 | 1385 | 1321 | | | | |
| $K_1$ | 1278 | 1234 | 1376 | | | | |
| $K_2$ | 1329 | 1413 | 1316 | | | | |

61(261)

(i) 1328 Kg/ha. (ii) 467·3 Kg/ha. (iii) Interaction N×P×K alone is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 1888 | 1916 | 1927 | 1889 | 1871 | 1970 | 1910 |
| $N_1$ | 1679 | 2153 | 2153 | 2079 | 2018 | 1888 | 1995 |
| $N_2$ | 2058 | 1699 | 2071 | 2118 | 1783 | 1927 | 1943 |
| Mean | 1875 | 1923 | 2050 | 2029 | 1891 | 1828 | 1949 |
| $K_0$ | 1820 | 2085 | 2181 | | | | |
| $K_1$ | 1830 | 1888 | 1954 | | | | |
| $K_2$ | 1975 | 1795 | 2015 | | | | |

* * *

**Crop :- Cotton.** **Ref :. Ms. 63(137).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'M'.**

Object :—To find out the best time of application and suitable dose of N for Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 63 Q/ha. of F.Y.M. (ii) Heavy black cotton soil. (iii) 21.8.63. (iv) (a) 2 ploughings and cross ploughing, levelling of opening furrows. (b) Dibbled in furrows. (c) 11 Kg/ha. (d) 60 cm.×23 cm. (e) 2 to 3. (v) 56 Kg/ha. of $P_2O_5$+56 Kg/ha. of $K_2O$. (vi) *Laxmi*. (vii) Irrigated. (viii) 3 interculturings and 3 weedings. (ix) 40 cm. (x) 19 and 21.3 64.

2. TREATMENTS :

Same as in expt. no. 62 (57) on page 393.
This year $N_1$= 28 Kg/ha. and $N_2$=56 Kg/ha.

3. DESIGN :

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 3. (iv) (a) 10·7 m.× 7·3 m. (b) 8·3 m.×4·9 m. (v) 120 cm. ×120 cm. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Boll worm attack. (iii) Yield of *kapas*. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 139 Kg/ha. (ii) 74·1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=129 Kg/ha.

| | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 92 | 143 | 241 | 111 | 206 | 227 | 170 |
| $N_2$ | 127 | 113 | 114 | 83 | 94 | 145 | 113 |
| Mean | 110 | 128 | 178 | 97 | 150 | 186 | 141 |

* * *

**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 62(57), 64(23), 65(96).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'M'.**

Object :—To determine the optimum time of application of N to Cotton.

1. BASAL CONDITIONS ;

(i) (a) Wheat—Cotton (1962); Wheat—Cotton—*Jowar* ('64); *Jowar*—Cotton ('65). (b) Wheat ; Wheat ; *Jowar*. (c) 125·6 Q/ha. of F.Y.M.+44·8 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super ('62, '64); 120 Q/ha. of F.Y.M. in 65. (ii) Black cotton soil ('62) ; Black soil ('64) ; Medium black ('65). (iii) 11.8.62 ; 13.8.64 ; 18.8.65. (iv) (a) Working with kante, ('62) ; 4 ploughings ('64) ; ploughing and harrowing ('65). (b) Dibbling. (c) 10 Kg/ha. (d) 61 cm.×30 cm. (e) 2. (v) 56 Kg/ha. of $P_2O_5$ as Super+56 Kg/ha. of $K_2O$ as Mur. Pot. applied before sowing ('62) ; 68·7 Kg/ha. of Super+208 Kg/ha. of Mur. Pot. ('64); 210 Kg/ha. of A/S+35 Kg/ha. of Super+94 Kg/ha. of Mur. Pot. ('65). (vi) *Laxmi*. (vii) Irrigated. (viii) 2 weedings ('62) ; 4 intercultivation and 1 hand weeding ('64) ; hand weeding and passing cultivation ('65), (ix) 49 cm.; 31 cm.; 14 cm. (x) 21.3.63; 22.2.65 to 31.3.65; N.A.

2. TREATMENTS :

All combinations of (1) and (2)+2 control plots

(1) 2 levels of N : $N_1$=124 and $N_2$=247 Kg/ha.

(2) 6 times of application : $T_1$=At sowing, $T_2$=At thinning, $T_3$=At flowering, $T_4$=½ dose at thinning +½ dose at sowing, $T_5$=½ dose at sowing+½ dose at flowering and $T_6$=½ dose at thinning+½ dose at flowering.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 14. (b) N.A. (iii) 3. (iv) (a) 1/198 ha. (1962 and 65); 8·3 m.×6·1 m. ('64). (b) 1/247 ha. (1962 and '65); 8·3 m.×4·9 m. ('65) (v) Yes (1962 and '65) ; 61 cm. on either side in ('64). (vi) Yes.

4. GENERAL :

(i) Good (1962) ; fair (1964 and 65). (ii) Jassids and Lumps noticed during crop growth. Endrine sprayed. Red leaf blite also noticed in 1962. Incidence of Aphids, Jassids and Red leaf. Aphids and Jassids controlled by spraying Endrine (1963). Aphids, Jassids and Thrips in 1965. Endrine sprayed. (iii) No. of bolls, flowers and good and bad boll opening, *kapas* yield. (iv) (a) 1962—N.A. (Treatments modified in 1964). (b) N.A. (c) As under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous. Treatments×years interaction is present.

5. RESULTS :

(i) 1034 Kg/ha. (ii) 205·3 Kg/ha. (based on 26 d.f. made up of Treatments×years interaction). (iii) Control *vs.* others effect alone is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=915 Kg/ha.

| | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 1044 | 1107 | 1054 | 939 | 1142 | 1009 | 1049 |
| $N_2$ | 1105 | 1059 | 932 | 1145 | 1048 | 1060 | 1058 |
| Mean | 1074 | 1083 | 993 | 1042 | 1095 | 1034 | 1054 |

C.D. for control *vs.* others=107·5 Kg/ha.

| Years | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | Sig. | $N_1$ | $N_2$ | Sig. | Control | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | 1272 | 1164 | 1254 | 1268 | 1282 | 1127 | N.S. | 1240 | 1215 | N.S. | 1178 | 1221 | 147·2 |
| 1964 | 1308 | 1431 | 1051 | 1127 | 1351 | 1306 | ** | 1232 | 1293 | N.S. | 970 | 1220 | 162·5 |
| 1965 | 643 | 653 | 674 | 733 | 652 | 671 | N.S. | 675 | 667 | N.S. | 598 | 661 | 87·0 |
| Pooled | 1074 | 1083 | 993 | 1042 | 1095 | 1034 | N.S. | 1049 | 1058 | N.S. | 915 | 1034 | 205·3 |

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**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 60(92), 62(60).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'M'.**

Object :— To find out the residual effect of organic and inorganic manures on the Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*. (b) *Jowar*. (c) Nil. (ii) Black soil. (iii) 8.9.60; 1.9.62. (iv) (a) Working with victory plough and hire kunte (1960) ; blade harrow and ridger in 1962. (b) Dibbling. (c) N.A. (d) 69 cm.× 30 cm. (e) N.A. (v) Nil. (vi) *Laxmi* (medium). (vii) Irrigated. (viii) Weeding and working with cultivation. (ix) 28 cm.; 33 cm. (x) 21.2.61 to 31.3.61; 2.2.63 to 10.4.63.

2. TREATMENTS :

**Main-plot treatments :**

3 sources of N : $S_1$=G.L., $S_2$=G.M. and $S_3$=A/S.

**Sub-plot treatments :**

3 levels of N : $N_0$=0, $N_1$=22·4 and $N_2$=44·8 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/124 ha. (b) 1/124 ha.; 1/247 ha. (v) Nil ; N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1958—62. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Both the error variances are homogeneous. Main-plot and sub-plot Treatments×years interactions are absent.

5. RESULTS :

(i) 644 Kg/ha. (ii) (a) 77·0 Kg/ha. (based on 14 d.f. made up of pooled error and main-plot Treatments× years interaction). (b) 125·8 Kg/ha. (based on 42 d.f. made up of pooled error and sub-plot Treatments× years interaction). (iii) Main effect of N alone is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | Mean |
|---|---|---|---|---|
| $S_1$ | 664 | 588 | 648 | 633 |
| $S_2$ | 534 | 613 | 716 | 621 |
| $S_3$ | 664 | 626 | 744 | 678 |
| Mean | 621 | 609 | 703 | 644 |

C.D. for N marginal means=73·3 Kg/ha.

| Years | $S_1$ | $S_2$ | $S_3$ | Sig. | S.E./Main plot | $N_0$ | $N_1$ | $N_2$ | Sig. | G.M. | S.E./Sub-plot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 643 | 625 | 685 | N.S. | 59·0 | 688 | 604 | 661 | N.S. | 657 | 134·6 |
| 1962 | 623 | 617 | 671 | N.S. | 100·8 | 554 | 614 | 744 | * | 637 | 96·8 |
| Pooled | 633 | 621 | 678 | N.S. | 77·0 | 621 | 609 | 703 | * | 644 | 125·8 |

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 62(59), 63(36).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'M'.**

Object :—To find the optimum combination of N, P and K for Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton. (b) *Jowar*. (c) 251·1 Q/ha. of F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (ii) Black cotton soil. (iii) 14.8.62; 21.8.63. (iv) (a) 2 ploughings (1962); ploughing, passing kunte and ridger ('63). (b) Dibbling. (c) 10 to 12 Kg/ha. (d) 61 cm.×30 cm.; 69 cm.×30 cm. (e) 2. (v) Nil; 125·6 Q/ha. of F.Y.M. (vi) *Laxmi*. (vii) Irrigated. (viii) Weeding, thinning and intercultivation. (ix) 54 cm.; 26 cm. (x) 4.2 63 to 9.4.63; 24.1.64 to 6.3.64.

2. TREATMENTS :

All combinations of ( ), (2) and (3)

(1) 3 levels of N as A/S : $N_0$=0, $N_1$=28 and $N_2$=56 Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_0$=0, $P_1$=28 and $P_2$=56 Kg/ha.
(3) 3 levels of $K_2O$ as Mur. Pot : $K_0$=0, $K_1$=28 and $K_2$=56 Kg/ha.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) 6·9 m.×49·4 m. (iii) 2. (iv) (a) 6·9 m.×5·5 m.; 6·9 m.×4·3 m. (b) 4·1 m.×4·3 m.; 5·5 m.×3·7 m. (v) 137 cm.×61 cm.; 69 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Good; Normal. (ii) Aphids, Jassids were observed. Heavy attack of thrips, sprayed with endrine. (iii) Germination count, height of plants and yield of *kapas*. (iv) (a) 1961 – N.A. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous. Treatments×years interaction is absent.

5. RESULTS :

62(59)

(i) 1176 Kg/ha. (ii) 229·1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

|  | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 1132 | 1219 | 1059 | 1078 | 1231 | 1101 | 1137 |
| $N_1$ | 1215 | 1327 | 1319 | 1263 | 1273 | 1325 | 1287 |
| $N_2$ | 982 | 1160 | 1166 | 1113 | 1115 | 1081 | 1103 |
| Mean | 1110 | 1235 | 1181 | 1151 | 1206 | 1169 | 1176 |
| $K_0$ | 971 | 1283 | 1200 |  |  |  |  |
| $K_1$ | 1293 | 1189 | 1138 |  |  |  |  |
| $K_2$ | 1065 | 1234 | 1207 |  |  |  |  |

**63(36)**

(i) 331 Kg/ha. (ii) 119·6 Kg/ha. (iii) Only the interaction $N \times K$ is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 257 | 317 | 353 | 247 | 361 | 319 | 309 |
| $N_1$ | 336 | 371 | 334 | 305 | 380 | 357 | 347 |
| $N_2$ | 267 | 301 | 447 | 415 | 293 | 308 | 338 |
| Mean | 287 | 330 | 378 | 322 | 345 | 328 | 331 |
| $K_0$ | 271 | 306 | 389 | | | | |
| $K_1$ | 327 | 360 | 347 | | | | |
| $K_2$ | 262 | 323 | 398 | | | | |

C.D. for $N \times K$ table=143·3 Kg/ha.

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**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 63(135), 64(29), 65(95).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'M'.**

Object :—To find out suitable manurial requirements for irrigated Cotton.

## 1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 125·6 Q/ha. of F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (ii) Medium black; black soil ; N.A. (iii) 3.9.63 ; 21.8.64 ; N.A. (iv) (a) 1 ploughing and 1 harrowing in 63 ; working victory plough, kunte and ridger in 64; N.A. (b) Hand dibbling. (c) 10 to 11Kg/ha. (d) 5cm. between plants; 61 cm.×30 cm. ;N.A. (e) 3 ; 2 ; N.A. (v) Nil. (vi) *Laxmi*. (vii) Irrigated. (viii) Weedings and intercultivation. (ix) 40 cm.; 27 cm. ; N.A. (x) 10.3.64 to 3.4.64; 2.2.65 to 10.3.65 ; N.A.

## 2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 3 levels of F.Y.M. : $F_0$=0, $F_1$=62·8 and $F_2$=125·6 Q/ha.
(2) 3 levels of N as A/S : $N_0$=0, $N_1$=56·0 and $N_2$=112·1 Kg/ha.
(3) 3 levels of P as Super : $P_0$=0, $P_1$=56·0 and $P_2$=112·1 Kg/ha.
(4) 3 levels of K as Mur. Pot. : $K_0$=0, $K_1$=56·0 and $K_2$=112·1 Kg/ha.

## 3. DESIGN :

(i) $3^4$ confd. (ii) (a) 9 plots/block; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 8·3 m.×5·5 m.; 1/247 ha.; 8·3 m.×4·9 m. (b) 5·5 m.×3·7 m.; 1/494 ha.; 5·5 m.×3·7 m. (v) 138 cm.×91 cm.; 1 row on either side; 138 cm.×61 cm. (vi) Yes.

## 4. GENERAL :

(i) Fair. (ii) Attack of Thrips, Jassids and Boll worm. Endrine sprayed. (iii) Yield of *kapas*. (iv) (a) 1963 to 65. (b) No. (c) Nil. (v) Dharwar, Gadag and Bagalkot. (vi) N.A. (vii) Error variances are heterogeneous. Treatments×years interaction is absent.

## 5. RESULTS :

**63(135)**

(i) 759 Kg/ha. (ii) 109·0 Kg/ha. (iii) Main effect of F alone is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 703 | 626 | 781 | 695 | 707 | 708 | 658 | 722 | 730 | 703 |
| $F_1$ | 788 | 815 | 805 | 838 | 762 | 808 | 807 | 823 | 778 | 803 |
| $F_2$ | 758 | 767 | 785 | 695 | 787 | 798 | 823 | 693 | 794 | 770 |
| Mean | 750 | 736 | 790 | 753 | 752 | 771 | 763 | 746 | 767 | 759 |
| $K_0$ | 744 | 760 | 784 | 808 | 701 | 779 | | | | |
| $K_1$ | 787 | 661 | 790 | 713 | 770 | 755 | | | | |
| $K_2$ | 718 | 787 | 797 | 738 | 784 | 780 | | | | |
| $P_0$ | 725 | 724 | 810 | | | | | | | |
| $P_1$ | 758 | 747 | 750 | | | | | | | |
| $P_2$ | 766 | 737 | 811 | | | | | | | |

C.D. for F marginal means=63 0 Kg/ha.

6 4(29)

(i) 1132 Kg/ha. (ii) 2·0·7 Kg/ha. (iii) Main effect of N is highly significant and that of F is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 877 | 1122 | 1194 | 1037 | 1119 | 1037 | 1151 | 974 | 1069 | 1064 |
| $F_1$ | 934 | 1067 | 1265 | 1022 | 1144 | 1101 | 1092 | 1088 | 1086 | 1089 |
| $F_2$ | 1136 | 1282 | 1311 | 1280 | 1227 | 1222 | 1325 | 1173 | 1231 | 1243 |
| Mean | 982 | 1157 | 1257 | 1113 | 1163 | 1120 | 1190 | 1078 | 1128 | 1132 |
| $K_0$ | 991 | 1277 | 1301 | 1208 | 1168 | 1192 | | | | |
| $K_1$ | 1003 | 1012 | 1220 | 1092 | 1193 | 950 | | | | |
| $K_2$ | 953 | 1182 | 1250 | 1039 | 1128 | 1218 | | | | |
| $P_0$ | 1048 | 1102 | 1189 | | | | | | | |
| $P_1$ | 916 | 1269 | 1304 | | | | | | | |
| $P_2$ | 983 | 1099 | 1278 | | | | | | | |

C.D. for N marginal means=126 9 Kg/ha.

65(95)

(i) 1246 Kg/ha. (ii) 210·9 Kg/ha. (iii) Main effects of N and F are highly significant. K effect is significant. (iv) Av, yield of *kapas* in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 1030 | 971 | 1195 | 1103 | 1043 | 1050 | 970 | 1169 | 1057 | 1065 |
| $F_1$ | 1199 | 1367 | 1396 | 1350 | 1197 | 1415 | 1251 | 1330 | 1381 | 1321 |
| $F_2$ | 1167 | 1368 | 1519 | 1351 | 1318 | 1385 | 1247 | 1358 | 1448 | 1351 |
| Mean | 1132 | 1235 | 1370 | 1268 | 1186 | 1283 | 1156 | 1286 | 1295 | 1246 |
| $K_0$ | 1092 | 1155 | 1220 | 1160 | 1102 | 1205 | | | | |
| $K_1$ | 1110 | 1276 | 1471 | 1368 | 1098 | 1392 | | | | |
| $K_2$ | 1194 | 1274 | 1419 | 1275 | 1358 | 1253 | | | | |
| $P_0$ | 1203 | 1206 | 1395 | | | | | | | |
| $P_1$ | 1017 | 1257 | 1283 | | | | | | | |
| $P_2$ | 1175 | 1243 | 1432 | | | | | | | |

C.D. for N, K or F marginal means=116·0 Kg/ha.

**Crop :- Cotton.** **Ref :- Ms. 60, 61, 62, 63, 64(M.A.E).**

**Site :- M.A.E. Centre, Gangavathi.** **Type :- 'M'.**

Object :—Type II : To study the effect of different levels of N, P, K and F.Y.M. on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*—Groundnut. (b) Groundnut. (c) Nil. (ii) Medium deep black. (iii) 27.8.60; 29.8.61; 26.8.62; 28.8.63; 25.8.64. (iv) (a) 2 ploughings and 4 to 5 harrowings. (b) Dibbling on ridges. (c) 16 8 Kg/ha. (d) 61 cm.×30 cm. (e) Nil. (v) Nil. (vi) *Laxmi*. (vii) Irrigated. (viii) Weeding and interculturing. (ix) 21·8 cm.; 21·6 cm.; 47·7 cm.; N.A.; N.A. (x) 12.2.61 to 1.4.61; 31.1.62 to 4.4.62; 28.2.63 to 22.4.63; 7.4.64; 4.4.65.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=33·6$ and $N_2=67·2$ Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_0=0$, $P_1=33·6$ and $P_2=67·2$ Kg/ha.
(3) 3 levels of $K_2O$ as Mur. Pot. : $K_0=0$, $K_1=33·6$ and $K_2=67·2$ Kg/ha.
(4) 2 levels of F.Y.M. : $F_0=0$ and $F_1=56·0$ Kg/ha.

3. DESIGN :

(i) $3^3 \times 2$ Fact. confd. (ii) (a) 9 plots/block; 6 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 15·5 m.×6·7 m. (b) 14·3 m.×5·5 m. (v) 61 cm.×61 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Attack of Thrips and Aphids controlled by spraying Folidol and Endrine. (iii) Yield of *kapas*. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

60(M.A.E.)

(i) 577 Kg/ha. (ii) 135·6 Kg/ha. (iii) Main effect of P is significant and that of N is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 452 | 599 | 572 | 406 | 581 | 636 | 563 | 516 | 544 | 541 |
| $F_1$ | 544 | 646 | 646 | 507 | 664 | 665 | 609 | 599 | 628 | 612 |
| Mean | 498 | 623 | 609 | 457 | 623 | 650 | 586 | 558 | 586 | 577 |
| $K_0$ | 498 | 655 | 605 | 470 | 636 | 652 | | | | |
| $K_1$ | 507 | 572 | 595 | 397 | 627 | 650 | | | | |
| $K_2$ | 489 | 642 | 627 | 504 | 606 | 648 | | | | |
| $P_0$ | 461 | 480 | 430 | | | | | | | |
| $P_1$ | 480 | 646 | 743 | | | | | | | |
| $P_2$ | 553 | 743 | 654 | | | | | | | |

C.D. for N or P marginal means=93·3 Kg/ha.

**61(M A.E.)**

(i) 1111 Kg/ha. (ii) 88·0 Kg/ha. (iii) Main effect of F, N, P, K and interactions N×P, N×K are highly significant. Interaction F×N and F×K are significant. (iv) Av yield of *kapas* in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 959 | 1171 | 1005 | 867 | 1162 | 1106 | 941 | 1033 | 1161 | 1045 |
| $F_1$ | 1033 | 1264 | 1236 | 950 | 1300 | 1284 | 1144 | 1171 | 1219 | 1178 |
| Mean | 996 | 1217 | 1120 | 908 | 1231 | 1195 | 1042 | 1102 | 1190 | 1111 |
| $K_0$ | 968 | 1199 | 959 | 784 | 1217 | 1125 | | | | |
| $K_1$ | 950 | 1227 | 1129 | 913 | 1180 | 1213 | | | | |
| $K_2$ | 1070 | 1226 | 1273 | 1027 | 1296 | 1247 | | | | |
| $P_0$ | 885 | 1098 | 741 | | | | | | | |
| $P_1$ | 1107 | 1300 | 1286 | | | | | | | |
| $P_2$ | 996 | 1253 | 1336 | | | | | | | |

C.D. for N, P or K marginal means = 60·5 Kg/ha.
C.D. for F marginal means = 49·3 Kg/ha.
C.D. for N×P or N×K table = 104·8 Kg/ha.
C D. for F×N or F×K table = 85·6 Kg/ha.

**62(M.A.E.)**

(i) 642 Kg/ha. (ii) 73·6 Kg/ha. (iii) Main effects of F, N and P are highly significant. Interaction N×P, F×P are significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 430 | 513 | 501 | 292 | 529 | 623 | 479 | 461 | 504 | 481 |
| $F_1$ | 735 | 818 | 855 | 698 | 838 | 872 | 842 | 792 | 774 | 803 |
| Mean | 583 | 665 | 678 | 495 | 683 | 747 | 660 | 626 | 639 | 642 |
| $K_0$ | 600 | 674 | 707 | 481 | 698 | 802 | | | | |
| $K_1$ | 568 | 672 | 639 | 481 | 709 | 689 | | | | |
| $K_2$ | 581 | 649 | 687 | 522 | 643 | 751 | | | | |
| $P_0$ | 496 | 476 | 513 | | | | | | | |
| $P_1$ | 604 | 746 | 700 | | | | | | | |
| $P_2$ | 648 | 774 | 820 | | | | | | | |

C.D. for N or P marginal means = 50·6 Kg/ha.
C.D. for F marginal means = 41·3 Kg/ha.
C.D. for body of N×P table = 87·7 Kg/ha.
C.D. for body of F×P table = 71·6 Kg/ha.

**63(M.A.E.)**

(i) 751 Kg/ha. (ii) 141·2 Kg/ha. (iii) Main effect of N alone is highly significant (iv) Av. yield of *kapas* in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 468 | 666 | 738 | 607 | 617 | 648 | 619 | 628 | 626 | 624 |
| $F_1$ | 766 | 907 | 960 | 831 | 815 | 987 | 923 | 833 | 877 | 878 |
| Mean | 617 | 786 | 849 | 719 | 716 | 817 | 771 | 731 | 751 | 751 |
| $K_0$ | 634 | 819 | 861 | 705 | 745 | 863 | | | | |
| $K_1$ | 561 | 778 | 853 | 698 | 696 | 798 | | | | |
| $K_2$ | 657 | 762 | 834 | 755 | 708 | 791 | | | | |
| $P_0$ | 581 | 773 | 844 | | | | | | | |
| $P_1$ | 578 | 774 | 797 | | | | | | | |
| $P_2$ | 693 | 812 | 947 | | | | | | | |

C.D. for N marginal means=97·2 Kg/ha.

**64(MA.E.)**

(i) 421 Kg/ha. (ii) 125·7 Kg/ha. (iii) Main effects of F, N and P are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 255 | 375 | 370 | 245 | 392 | 362 | 336 | 297 | 366 | 333 |
| $F_1$ | 389 | 497 | 640 | 426 | 536 | 564 | 530 | 486 | 510 | 509 |
| Mean | 322 | 436 | 505 | 336 | 464 | 463 | 433 | 391 | 438 | 421 |
| $K_0$ | 331 | 426 | 542 | 352 | 422 | 525 | | | | |
| $K_1$ | 311 | 408 | 455 | 284 | 462 | 428 | | | | |
| $K_2$ | 324 | 473 | 518 | 371 | 508 | 436 | | | | |
| $P_0$ | 258 | 359 | 390 | | | | | | | |
| $P_1$ | 348 | 458 | 586 | | | | | | | |
| $P_2$ | 360 | 490 | 539 | | | | | | | |

C.D. for N or P marginal means=86·5 Kg/ha.
C.D. for F marginal means =70·6 Kg/ha.

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**Crop :- Cotton.** **Ref :- Ms. 60(M.A.E).**

**Site :- M.A.E. Centre, Gangavathi.** **Type :- 'M'.**

Object :—Type V :—To study the effect of different times of application of N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—Black gram—*Rabi Jowar*. (b) *Jowar*. (c) 22·4 Kg/ha. of N as A/S. (ii) Deep black. (iii) 20.8.60. (iv) (a) 2 ploughings and 4 harrowings. (b) Dibbling. (c) 17 Kg/ha. (d) 60 cm. × 30 cm. (e) Nil. (v) 56 Q/ha. of F.Y.M.+22·4 Kg/ha. of $P_2O_5$. (vi) *Laxmi* cotton. (vii) Irrigated. (viii) 2 weedings and 3 hoeings. (ix) N.A. (x) 14.2.61 to 31.3.61.

2. TREATMENTS :

All combinations of (1) and (2)+a control

(1) 2 sources of 56·0 Kg/ha. of N : $S_1$=A/S and $S_2$=Urea.

(2) 6 times of application of N : $T_1$=Full dose at sowing, $T_2$=Full dose at first interculture, $T_3$=Full dose at flowering, $T_4=\frac{1}{2}$ at sowing+$\frac{1}{2}$ at flowering, $T_5=\frac{1}{3}$ at sowing+$\frac{1}{3}$ at first interculture+$\frac{1}{3}$ at flowering and $T_6=\frac{1}{2}$ at flowering+$\frac{1}{2}$ one month after flowering.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Yield of *kapas*. (iv) (a) 1957–60. (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 621 Kg/ha. (ii) 83·9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=56·3 Kg/ha.

| | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | Mean |
|---|---|---|---|---|---|---|---|
| $S_1$ | 701 | 544 | 627 | 664 | 646 | 609 | 632 |
| $S_2$ | 599 | 627 | 636 | 590 | 636 | 636 | 621 |
| Mean | 650 | 586 | 632 | 627 | 641 | 622 | 626 |

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**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 64 and 65(M.A.E).**

**Site :- M.A.E. Centre, Gangavathi.** **Type :- 'M'.**

Object :—Type V (a) : To study the effect of different methods of application of N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut. (c) Nil. (ii) Medium black. (iii) 30.8.64; N.A. (iv) (a) 1 ploughing and 4 harrowings. (b) Sowing with seed drill. (c) 15 Kg/ha. (d) 50 cm.×30 cm. (e) N.A. (v) Nil. (vi) *Laxmi.* (vii) Irrigated. (viii) 4 weedings and 3 interculturings. (ix) N.A. (x) 3 pickings from 23.2.65 to 6.4.65; N.A.

2 TREATMENTS :

All combinations of (1) and (2)+a control

(1) 2 levels of N : $N_1$=60 and $N_2$=120 Kg/ha.

(2) 5 methods of application : $M_1$=Broadcast at sowing, $M_2$=Placement of fertilizer one week before sowing about 12·5 cm. deep by plough sole method, $M_3$=Placement of fertilizer in the same line as seed by seed cum fertilizer drill, $M_4$=Placement of fertilizer about 4 cm. below the seed by seed cum fertilizer drill and $M_5$=Band placement of fertilizer about 5 cm. below and 5 cm. away from the seed.

. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Attack of Aphids. Sprayings with Folidol and Endrine. (iii) Yield of *kapas*. (iv) (a) 1964—65. (b) N.A. (c) Results of combined analysis are presented under 5. Results. (v) to (vii) Nil.

5. RESULTS :

(i) 533 Kg/ha. (ii) and (iii) N.A. (iv) Av. yield of *kapas* in Kg/ha.

Control=568 Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $N_1$ | $N_2$ |
|---|---|---|---|---|---|---|---|
| Mean yield | 537 | 465 | 544 | 573 | 526 | 568 | 489 |

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**Crop :- Cotton (*Rabi*).**

**Ref :- Ms. 63, 64 (S.F.T.) for Bellary and 65(S.F.T.) for Raichur.**

**Site :- (District) : Bellary and Raichur.**

**Type :- 'M'.**

Object :—Type $A_1$ To study the response curves of important cereal, cash and oilseed crops to Nitrogen applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red sandy. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :
O =Control (no manure).
$N_1$ =35 Kg/ha. of N.
$N_2$ =70 Kg/ha. of N.
$P_1$ =25 Kg/ha. of $P_2O_5$.
$N_1P_1$ =35 Kg/ha. of N+25 Kg/ha. of $P_2O_5$.
$N_2P_1$ =70 Kg/ha. of N+25 Kg/ha. of $P_2O_5$
$N_2P_2$ =70 Kg/ha. of N+ 50 Kg/ha. of $P_2O_5$
$N_2P_2K_1$=70 Kg/ha. of N+50 Kg/ha. of $P_2O_5$ + 25 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

(i) & (ii) A selected district is divided into four agriculturally homogeneous zones based on climate,soil, cropping pattern etc. In each zone one block is selected at random. A block normally consists of a group of 50-100 villages. In each block 36 experiments are conducted in a year of which 11 are of type $A_1$, 11 of type $A_2$, 11 of type $A_3$ and 3 are of type C. The eleven experiments under type $A_1$, $A_2$ and $A_3$ are distributed as 3 on a *Kharif* cereal, 3 on a *rabi* cereal, 3 on a cash crop and 2 on oil seed. All the three type-C experiments are conducted on a legume crop. For the purpose of conducting the $A_1$, $A_2$ and $A_3$ experiments 11 villages are randomly selected in each block and in each village 3 experiments one each of type $A_1$, $A_2$ and $A_3$ are laid out. For conducting the three type-C trials three villages are randomly selected in each block. (iii) and (iv) N.A.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1963 to 1965 [1964 N.A.]for Bellary ; 1965 to 1966 for Raichur. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**Bellary**

63(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of *kapas* in Kg/ha. | 160 | 316 | 233 | 295 | 433 | 521 | 731 | 139·8 |

Control yield=257 Kg/ha. ; No. of trials=5.

65(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of *kapas* in Kg/ha. | – 23 | 2 | —20 | 26 | 57 | 86 | 91 | 28·9 |

Control yield=258 Kg/ha. ; No. of trials=5.

**Raichur**

65(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of *kapas* in Kg/ha. | 41 | 42 | 38 | 73 | 63 | 71 | 102 | 22·9 |

Control yield=241 Kg/ha. ; No. of trials=6.

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**Crop :- Cotton (*Kharif*).** **Ref :- Ms. 63, 64 (S.F.T.).**

**Site :- (District) : Bellary.** **Type :- 'M'.**

Object :—Type $A_1$ : To study the response curves of important cereal, cash and oilseed crops to Nitrogen applied singly and in combination with other nutrients.

.1 BASAL CONDITIONS :

(i) N.A. (ii) Red sandy. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in Type $A_1$ (*Rabi*) on page 402.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1963 to 1964. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

63(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E |
|---|---|---|---|---|---|---|---|---|
| Av. response of *kapas* in Kg/ha. | 122 | 195 | 244 | 239 | 201 | 314 | 404 | 32·1 |

Control yield=233 Kg/ha. ; No. of trials=4.

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of *kapas* in Kg/ha. | 86 | 133 | 73 | 155 | 204 | 272 | 296 | 25·0 |

Control yield=461 Kg/ha.; No. of trials=6.

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**Crop :- Cotton (*Rabi*).**

**Site :- (District) : Bellary and Raichur.**

**Ref :- Ms. 63, 65 (S.F.T.) for Bellary and 65(S.F.T.) for Raichur.**

**Type :- 'M'.**

Object :— Type $A_2$ : To study the response curves of important cereal, cash and oilseed crops to Phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red sandy. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :
O =Control (no manure).
$N_1$ =35 Kg/ha. of N.
$P_1$ =25 Kg/ha. of $P_2O_5$.
$P_2$ =50 Kg/ha. of $P_2O_5$.
$N_1P_1$ =35 Kg/ha. of N+25 Kg/ha. of $P_2O_5$.
$N_1P_2$ =35 Kg/ha. of N+50 Kg/ha. of $P_2O_5$.
$N_2P_2$ =70 Kg/ha. of N+50 Kg/ha. of $P_2O_5$.
$N_2P_2K_1$=70 Kg/ha. of N+50 Kg/ha. of $P_2O_5$+25 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in Type $A_1$ (*Rabi*) on page 402.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1963 to 1965 [1964 N.A.] for Bellary and 1963 to 1966 [1963 and 1964 N.A] for Raichur. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

Bellary

63(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of *kapas* in Kg/ha. | 136 | 122 | 179 | 253 | 160 | 329 | 444 | 68·7 |

Control yield=297 Kg/ha. ; No. of trials=5.

65(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of *kapas* in Kg/ha. | 6 | 42 | —4 | 11 | 22 | 60 | 57 | 16·2 |

Control yield=160 Kg/ha. ; No. of trials=5.

Raichur

65(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of *kapas* in Kg/ha. | 17 | 5 | 13 | 15 | 23 | 32 | 52 | 11·6 |

Control yield=135 Kg/ha. ; No. of trials=6.

**Crop :- Cotton** (*Kharif*). **Ref :- Ms. 63, 64 (S.F.T.).**

**Site :- (District) : Bellary.** **Type :- 'M'.**

Object :—Type $A_2$ : To study the response curves of important cereal, cash and oilseed crops to Phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red sandy. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN:

Same as Type $A_2$ (*Rabi*) on page 404.

4. GENERAL :

(i) to (iii) N.A. (iv) 1963 to 1964. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

63(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of *kapas* in Kg/ha. | 85 | 84 | 86 | 124 | 120 | 142 | 207 | 37·8 |

Control yield=280 Kg/ha. ; No. of trials=2.

64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of *kapas* in Kg/ha. | 119 | 77 | 124 | 152 | 201 | 274 | 319 | 34·8 |

Control yield=435 Kg/ha. ; No. of trials=6.

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**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 63 to 65(S.F.T.) for Bellary and 65 (S.F.T.) for Raichur.**

**Site :- (District) : Bellary and Raichur.** **Type :- 'M'.**

Object :—Type $A_3$ : To study the response curves of important cereal, cash and oilseed crops to Potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red sandy. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :

O =Control (no manure).
$N_1$ =35 Kg/ha. of N.
$K_1$ =25 Kg/ha. of $K_2O$.
$K_2$ =50 Kg/ha. of $K_2O$.
$N_1K_1$ =35 Kg/ha. of N+25 Kg/ha. of $K_2O$.
$N_1K_2$ =35 Kg/ha. of N+50 Kg/ha. of $K_2O$.
$N_2K_2$ =70 Kg/ha. of N+50 Kg/ha. of $K_2O$.
$N_1P_1K_1$ =35 Kg/ha. of N+25 Kg/ha. of $P_2O_5$+25 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in Type $A_1$ (*Rabi*) on page 402.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1963to 1965 [1964—N.A.] for Bellary and 1963 to 1966 [1963 and 1964—N.A.] for Raichur. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

**Bellary**

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E |
|---|---|---|---|---|---|---|---|---|
| Av. response of *kapas* in Kg/ha. | 92 | 63 | 44 | 150 | 147 | 267 | 321 | 36·8 |

Control yield=237 Kg/ha. ; No. of trials=5.

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of *kapas* in Kg/ha. | 22 | 6 | 18 | 45 | 9 | 20 | 56 | 17·5 |

Control yield= 192 Kg/ha. ; No. of trials=5.

65(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of *kapas* in Kg/ha. | 14 | 4 | 14 | 19 | 20 | 52 | 75 | 26·1 |

Control yield=112 Kg/ha. ; No. of trials=5.

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**Crop :- Cotton** (*Kharif*). **Ref :- Ms. 63, 64 (S.F.T.).**

**Site :- (District) : Bellary. Type :- 'M'.**

Object :—Type $A_3$ : To study the response curves of important cereal, cash and oilseed crops to Potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :
(i) N.A. (ii) Red sandy. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS : and 3. DESIGN :

Same as in type $A_3$ (*Rabi*) on page 405.

4. GENERAL INFORMATION :

(i) to (iii) N.A. (iv) (a) 1963 to 1964 (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

63(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of *kapas* in Kg/ha. | 104 | 8 | 41 | 97 | 133 | 162 | 299 | 18·4 |

Control yield=169 Kg/ha. ; No. of trials=4.

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of *kapas* in Kg/ha. | 135 | 66 | 97 | 178 | 147 | 262 | 275 | 20·1 |

Control yield=355 Kg/ha. ; No. of trials=6.

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**Crop :- Cotton** (*Kharif*). **Ref :- Ms. 63(131).**

**Site :- Agri. Res. Stn., Bagalkot.** **Type :- 'C'.**

Object :— To study the effect of different cultural practices on the germination and yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 62·8 Q/ha. of F.Y.M. (ii) Medium black cotton soil. (iii) $A_0$= 2.9.1963 and $A_1$=25.9.1963. (iv) (a) Ploughing and cross ploughing. Levelling and opening furrows. (b) Dibbled in furrows. (c) As per treatments. (d) and (e) N.A. (v) 62·8 Q/ha. of F.Y.M. (vi) *Suyodhar* cotton. (vii) Unirrigated. (viii) As per trertments. (ix) 40 cm. (x) 14.2.1964 to 31.3.1964.

2. TREATMENTS :

All combinations of (1), (2), (3), (4), (5) and (6)

(1) 2 timings of sowings : $A_0$=Early sowing and $A_1$=Normal sowing.
(2) 2 types of bunding : $B_0$=Non-contour bunding and $B_1$=Contour bunding.
(3) 2 mulchings : $C_0$=Non-mulching and $C_1$=Mulching.
(4) 2 methods of sowing : $D_0$=Line sowing without side-furrows and $D_1$=Line sowing with side furrows.
(5) 2 seed rates : $E_0$=6·7 Kg/ha. and $E_1$=10·1 Kg/ha.
(6) 2 levels of intercultivation : $F_0$=2 and $F_1$=4 intercultivations.

3. DESIGN :

(i) $2^6$ Fact. Confd. (ii) 8 plots/block ; 8 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 7·9 m.× 5·5 m. (v) 2 rows on all sides. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) and (b) No. (c) Nil. (v) Gadag. (vi) and (vii) Nil.

5. RESULTS :

(i) 425 Kg/ha. (ii) 92·0 Kg/ha. (based on 31 d.f. made up of higher order interactions. (iii) Main effect of A and interaction D×E×F are highly significant. Interactions B×C, C×E, A×C×D and B×C×E are significant. (iv) Table of mean and differential response in Kg/ha.

| | Mean response | Differential response | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | | B | | C | | D | | E | | F | |
| | | — | + | — | + | — | + | — | + | — | + | — | + |
| A | —159·4 | — | — | —141·7 | —177·1 | —175·8 | —143·0 | —165·3 | —153·5 | —159·7 | —159·1 | —175·4 | —143·4 |
| B | —11·9 | 5·8 | —29·6 | — | — | --73·4 | 49·6 | —1·4 | —22·4 | 1·6 | —25·4 | 20 4 | —44·2 |
| C | 10·6 | —5·8 | 27·0 | —50·9 | 72·1 | — | — | 41·4 | —20·2 | 67·7 | —46·5 | 36·8 | - 15·6 |
| D | 7·6 | 1·7 | 13·5 | 18·1 | —2·9 | 38·4 | —23·2 | — | — | —6·2 | 21·4 | —12·7 | 27·9 |
| E | 12·6 | 12·3 | 12 9 | 26·1 | —0·9 | 69·7 | —44·5 | —1·2 | 26·4 | — | — | 43·9 | —18·7 |
| F | 15·7 | —0·3 | 31·7 | 48·0 | —16·6 | 41·9 | —10·5 | —4·6 | —36·0 | 47·0 | —15·6 | — | -- |

C.D. for mean response of A =46·9 Kg/ha.
C.D. for differential response of B×C and C×E=66·3 Kg/ha.

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**Crop :- Cotton (*Kharif*).** **Ref :- Ms. 63(126).**

**Site :- Agri. Res. Stn., Bagalkot.** **Type :- 'C'.**

Object :— To study the effect of deep ploughing and intercultivation on the yield of cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 62·8 Q/ha. of F.Y.M. (ii) Medium black cotton soil. (iii) 7.9.1963. (iv) (a) As per treatments. (b) to (e) N.A. (v) 62·8 Q/ha. of F.Y.M. (vi) *Suyodhar*. (vii) Unirrigated. (viii) As per treatments. (ix) 40 cm. (x) 2.3.1964 to 17.4.1964.

2. TREATMENTS :

**Main-plot treatments :**

6 phases of ploughing : $P_1$=PPP, $P_2$=OP, $P_3$=PO, $P_4$=OOP, $P_5$=OPO and $P_6$=POO.

**Sub-plot treatments :**

2 types of ploughing : $M_1$=Deep ploughing and $M_2$=Local practices.

**Sub-sub-plot treatments :**

4 cultural practices : $C_0$=No intercultivation, $C_1$=1 intercultivation, $C_2$=2 intercultivations and $C_3$=Chemical weedicides (Femoxome at 0·68 Kg. of acide equivalent in 769 litres of water/ha).

PPP—Ploughing all the years. OP or PO—ploughing once in two years and OOP, OPO or POO—ploughing once in three years.

3. DESIGN:

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 2 sub-plots/main-plot ; 4 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8·5 m.×4·9 m. (v) 2 rows alround. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1963—N.A. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Treatments $P_1$, $P_3$ and $P_6$ are alike while $P_2$, $P_4$ and $P_5$ are alike during the 1st year.

5. RESULTS :

(i) 355 Kg/ha. (ii) (a) 98·2 Kg/ha. (based on 9 d.f. (b) 52·3 Kg/ha. (based on 10 d.f.) (c) 62·2 Kg/ha. (based 60 d.f.) (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $C_0$ | $C_1$ | $C_2$ | $C_3$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $P_1+P_3+P_6$ | 342 | 344 | 382 | 353 | 350 | 360 | 355 |
| $P_2+P_4+P_5$ | 346 | 336 | 361 | 377 | 344 | 366 | 355 |
| Mean | 344 | 340 | 372 | 365 | 347 | 363 | 355 |
| $M_1$ | 322 | 334 | 378 | 353 | | | |
| $M_2$ | 366 | 345 | 365 | 377 | | | |

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 60(33).**

**Site :- Soil Cons. Res. Centre, Bellary.** **Type :- 'C'.**

Object :— To find the comparative merit of presoaked sowing over that of ordinary unsoaked seed.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cowpeas. (c) Nil. (ii) Black cotton soil. (iii) 27.9.60. (iv) (a) Harrowing. (b) Drilling. (c) 8 Kg/ha. (d) 91 cm. (e) N.A. (v) 28·0 Q/ha. of F.Y.M. (vi) $W_1$. (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 5 cm. (x) 12.3.61.

2. TREATMENTS :

2 seed treatments : $T_0$=Ordinary seed (unsoaked) and $T_1$=Seed presoaked for 24 hrs.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 4·9 m.×4·3 m. (b) 3·7 m.×3·1 m. (v) 61 cm.×61 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1959 to 1960. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3326 Kg/ha. (ii) 800·3 Kg/ha. (iii) Treatment difference is not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ |
|---|---|---|
| Av. yield | 3339 | 3313 |

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 60(209).**

**Site :- Soil Cons. Res. Stn., Bellary.** **Type :- 'C'.**

Object :— To study the effect of weeding within the line in addition to the normal cultivating with respect to the economics of the operation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) N.A. (ii) Deep black cotton soil. (iii) 27.9.60. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 8 Kg/ha. (d) 91 cm.×23 cm. (e) 1. (v) Nil. (vi) Western—1 (late). (vii) Unirrigated. (viii) Handweeding. (ix) 44 cm. (x) 13.2.61 and 14.3.61.

2. TREATMENTS :

2 cultural treatments : $T_1$=Intercultivation only and $T_2$=Intercultivating+line weeding.

3. DESIGN :

(i) AB—BA method. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) N.A, (b) 15·2 m.×12·2 m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1959—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 148 Kg/ha. (ii) 56·4 Kg/ha. (iii) Treatment difference is not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_1$ | $T_2$ |
|---|---|---|
| Av. yield | 149 | 147 |

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 62(199).**

**Site :- Soil Cons. Res. Stn., Bellary.** **Type :- 'C'.**

Object :—To find out the optimum spacing between rows and plants.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) Deep black cotton soil. (iii) 10.9.62. (iv) (a) Light harrowing twice. (b) Dibbling. (c) 11 Kg/ha. (d) As per treatments. (e) 2. (v) Nil. (vi) Western—1 (late). (vii) Unirrigated. (viii) Hand weeding and thinning. (ix) 36 cm. (x) 29.3.1963.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 2 spacings between rows : $S_1$=91 and $S_2$=137 cm.
(2) 3 spacings between plants : $P_1$=30, $P_2$=46 and $P_3$=61 cm.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 6. (b) 43·9 m.×7·3 m. (iii) 4. (iv) (a) 13·7 m.×7·3 m. (b) 12·8 m.×7·3 m. (v) 46 cm. on either side. (vi) Yes.

4. GENERAL:

(i) Shedding of leaves due to diseases and flowers due to heavy rains. (ii) Disease observed. No control measure could be taken as the disease was not identified. (iii) Height, boll count, yield of *kapas*. (iv) (a) 1962 contd. (modified in 1963). (b) Yes. (c) Nil. (v) Nil. (vi) Unusual and heavy rainfall during December 1962. (vii) Nil.

5. RESULTS:

(i) 85 Kg/ha. (ii) 23·7 Kg/ha. (iii) Main effect of P alone is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_1$ | $P_2$ | $P_3$ | Mean |
|---|---|---|---|---|
| $S_1$ | 118 | 93 | 67 | 93 |
| $S_2$ | 89 | 74 | 68 | 77 |
| Mean | 104 | 84 | 68 | 85 |

C. D. for P marginal means=25·3 Kg/ha.

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 63(193), 64(145).**

**Site :- Soil Cons. Res. Stn., Bellary.** **Type :- 'C'.**

Object :—To find out the optimum spacing between rows and plants.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) *Jowar*. (c) 125 Q/ha. of F.Y.M. (ii) Deep black cotton soil. (iii) 25.9.1963 ; 20.9.1964. (iv) (a) Light harrowing twice. (b) Dibbling. (c) 11 Kg/ha. (d) As per treatments. (e) 1. (v) Nil. (vi) Western—1 (late). (vii) Unirrigated. (viii) Hand weeding and thinning. (ix) 15 cm ; 21 cm. (x) N.A. ; 4, 26.3.1965.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 2 spacings between rows : $S_1$=46 and $S_2$=91 cm.
(2) 4 spacings between plants : $P_1$=continuous, $P_2$=23, $P_3$=30 and $P_4$=46 cm.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 8. (b) 29·3 m.×9·1 m. (iii) 4. (iv) (a) 9·1 m.×7·3 m. (b) 9·1 m.×6·4 m. (v) One row on either side. (vi) Yes.

4. GENERAL :

(i) Poor boll opening due to moisture stress. (ii) Nil. (iii) Height, boll count and yield of *kapas*. (iv) (a) 1962 contd. (modified in 1963). (b) Yes. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous. Treatment × years interaction is absent.

5. RESULTS :

(i) 301 Kg/ha. (ii) 37·4 Kg/ha. (based on 49 d.f. made up of pooled error and Treatment × years interaction). (iii) Only P effect is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_1$ | $P_2$ | $P_3$ | $P_4$ | Mean |
|---|---|---|---|---|---|
| $S_1$ | 300 | 365 | 315 | 258 | 310 |
| $S_2$ | 298 | 313 | 291 | 270 | 293 |
| Mean | 299 | 339 | 303 | 264 | 301 |

C. D. for P marginal means=26.6 Kg/ha.

| Years | $P_1$ | $P_2$ | $P_3$ | $P_4$ | Sig. | $S_1$ | $S_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1963 | 261 | 284 | 245 | 227 | N.S. | 262 | 246 | N.S. | 262 | 34·0 |
| 1964 | 337 | 394 | 361 | 301 | N.S. | 357 | 340 | N.S. | 348 | 40·2 |
| Pooled | 299 | 339 | 303 | 264 | * | 310 | 293 | N.S. | 301 | 37·4 |

**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 63(192), 64(146).**

**Site :- Soil Cons. Res. Stn., Bellary.** **Type :- 'C'.**

Object:—To find out the benefits that accrue in leaving reservoirs alternating with sown strips.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) Nil. (ii) Deep black cotton soil. (iii) 25.9.1963 ; 19.9.64. (iv) (a) As per treatments. (b) Dibbling. (c) 8 Kg/ha. (d) 91 cm. × 23 cm. (e) One. (v) Nil. (vi) Western 1 (late). (vii) Unirrigated. (viii) Hand weeding and hoeing. (ix) 15 cm. ; 21 cm. (x) N.A.; 9 and 27.3.1965.

2. TREATMENTS :

(i) 5 cultural treatments : $T_0$=Control, $T_1$=Corrugations at 1·2 m. apart and the alternate ridges tied with grass, $T_2$=Scoops made at 1·2 m. apart with single basin lister, $T_3$=Corrugations made at 1·2 m. apart with a 'V' ditch, and $T_4$=Bunds put with a bund former at 1·2 m. apart.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 76·2 m. × 6·9 m. (iii) 4. (iv) (a) and (b) 15·2 m. × 6·9 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor growth. (ii) Generally poor boll bursting due to moisture stress. (iii) Yield of *kapas*. (iv) (a) 1963 to 64. (b) Yes. (c) As under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous. Treatments × years interaction is present.

### 5. RESULTS :

(i) 229 Kg/ha. (ii) 172·7 Kg/ha. based on 4 d.f. made up of Treatment×years interaction. (iii) Treatments differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. yield | 266 | 72 | 265 | 272 | 268 |

| Years | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|
| 1963 | 125 | 57 | 119 | 118 | 107 | ** | 105 | 22·8 |
| 1964 | 407 | 87 | 411 | 427 | 428 | ** | 352 | 88·0 |
| Pooled | 266 | 72 | 265 | 272 | 268 | N.S. | 229 | 172·7 |

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**Crop :- Cotton.** **Ref :- Ms. 63(127).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'C'.**

Object :—To study the effect of deep ploughing and intercultivation.

### 1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 62·8 Q/ha. of F.Y.M. (ii) Deep black cotton soil. (iii) 22.8.1963. (iv) (a) As per treatments. (b) Dibbled in furrows. (c) to (e) N.A. (v) 62·8 Q/ha. of F.Y.M. (vi) Jayadhar cotton. (vii) Unirrigated. (viii) 3 interculturings and 3 weedings. (ix) 41 cm. (x) 20.2.1964 to 27.3.1964.

### 2. TREATMENTS :

**Main-plot treatments** :

6 phases of ploughings : $P_1$=PPP, $P_2$=OP, $P_3$=PO, $P_4$=OOP, $P_5$=OPO and $P_6$=POO.

**Sub-plot treatments** :

3 types of ploughing : $M_1$=Normal ploughing, $M_2$=Blade harrowing and $M_3$=Deep ploughing.

**Sub-sub-plot treatments** :

6 applications of fertilizers : $F_0$=No fertilizer, $F_1$=Ploughing method to drop the fertilizers 13 cm. deep with the help of wooden plough about a week before sowing, $F_2$= By seed cum fertilizer drill (applied in seed lines), $F_3$=By seed cum fertilizer drill to drop the fertilizers 3·8 cm. deeper than the seed, $F_4$= By seed cum fertilizers drill dropping the fertilizers 51 cm. deep and 51 cm. away on one side of the seed line and $F_5$=Local method of fertilizers application

Amount of fertilizers applied N.A.

Note : PPP—Ploughing all the years, OP or PO—ploughing once in two years and OOP, POP POO denote ploughing once in three years.

### 3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 3 sub-plots/main-plot ; 6 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 4·3 m.×8·5 m. (v) 2 rows on all side. (vi) Yes.

### 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1963—N.A. (b) No. (c) Nil. (v) Bagalkot and Gadag. (vi) Rainfall ill distributed. (vii) Treatments $P_1$, $P_3$ and $P_6$ are alike and $P_2$, $P_4$ and $P_5$ are alike during 63.

### 5. RESULTS :

(i) 304 Kg/ha. (ii) (a) 648·9 Kg/ha. based on 9 d.f. (b) 200·6 Kg/ha. based on 20 d.f. (c) 41·5 Kg/ha. based on 150 d.f. (iii) F effect is highly significant. Interaction P×M×F is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $F_1$ | $F_2$ | $F_3$ | $F_4$ | $F_5$ | $F_6$ | $P_1+P_3+P_6$ | $P_2+P_4+P_5$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $M_1$ | 283 | 311 | 288 | 301 | 271 | 271 | 262 | 312 | 287 |
| $M_2$ | 308 | 308 | 273 | 295 | 285 | 251 | 268 | 306 | 287 |
| $M_3$ | 331 | 356 | 343 | 335 | 325 | 336 | 381 | 294 | 338 |
| Mean | 307 | 325 | 301 | 310 | 294 | 286 | 304 | 304 | 304 |
| $P_1+P_3+P_6$ | 314 | 315 | 294 | 308 | 299 | 293 | | | |
| $P_2+P_4+P_5$ | 300 | 335 | 309 | 312 | 289 | 279 | | | |

C. D. for F marginal means=20·4 Kg/ha.

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**Crop :- Cotton.** **Ref :- Ms.63(128).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'C'.**

Object : To study the effect of deep ploughing and intercultivation on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) Nil. (ii) Medium black. (iii) 24.9.1963. (iv) (a) As per treatments. (b) Dibbled in furrows. (c) to (e) N.A. (v) 62·8 Q/ha. of F.Y.M. (vi) *Laxmi* Cotton. (vii) Unirrigated. (viii) 3 interculturings and 3 weedings. (ix) 33 cm. (x) 22.2.1964 to 17.3.1964.

2. TREATMENTS :

Same as in expt. no. 63(126) on page 408.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 2 sub-plots/main-plot ; 4 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) N.A, (b) 7·0 m.×6·1 m. (v) 2 rows on all side. (vl) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1963—N.A. (b) No. (c) Nil. (v) Bagalkot and Dharwar. (vi) Uneven rainfall. (vii) Expt. conducted by Cotton Physiologist Agri. College. Dharwar. Treatments $P_1$, $P_3$ and $P_6$ are alike and $P_2$, $P_4$, $P_5$ are alike during 1963.

5. RESULTS :

(i) 319 Kg/ha. (ii) (a) 170·2 Kg/ha. based on 9 d.f. (b) 121·6 Kg/ha. based on 10 d.f. (c) 94·2 Kg/ha. based on 60 d.f. (iii) C effect is highly significant. Interaction M×C is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $P_1+P_3+P_6$ | 309 | 418 | 368 | 232 | 311 | 352 | 332 |
| $P_2+P_4+P_5$ | 277 | 364 | 385 | 196 | 312 | 299 | 306 |
| Mean | 293 | 391 | 376 | 214 | 311 | 326 | 319 |
| $M_1$ | 316 | 339 | 389 | 201 | | | |
| $M_2$ | 271 | 442 | 364 | 226 | | | |

C. D. for C marginal means=54·4 Kg/ha.
C. D. for M means at the same level of C=86·4 Kg/ha.
C. D. for C means at the same level of M=76·9 Kg/ha.

**Crop :- Cotton.** **Ref :- Ms.63(132).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'C'.**

Gbject :—To study the effect of different cultural practices on the germination and yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar.* (c) 62·8 Q/ha. of F.Y.M. (ii) Medium black cotton soil. (iii) 24.9.1963 and 28.9.1963. (iv) (a) Twice ploughing and cross ploughing, 3 harrowings and levelling. (b) Dibbling. (c) to (e) N.A. (v) 62·8 Q/ha. of F.Y.M. (vi) *Laxmi* Cotton. (vii) Unirrigated. (viii) 3 intercultivation and 3 weedings. (ix) 33 cm. (x) 21.2.1964.

2. TKEATMENTS :

As in expt. no. 63(131) on page 407 conducted at Bagalkot.

3. DESIGN :

(i) $2^6$ Fact. confd. (ii) (a) 8 plots/blocks ; 8 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 9·8 m.×4·6 m. (v) 2 rows on all round. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) *Kapas* yield. (iv) (a) N.A. (b) No. (c) Nil. (v) Bagalkot. (vi) Uneven rainfall occured during the crop season. (vii) Nil.

5. RESULTS :

(i) 819 Kg/ha. (ii) 210·7 Kg/ha. based on 31 d.f. (iii) Main effect of A alone is highly significant. (iv) Table of mean and differential response in Kg/ha.

| | Mean response | Differential response | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | | B | | C | | D | | E | | F | |
| | | + | — | + | — | + | — | + | — | + | — | + | — |
| A | —206·2 | — | = | —181·9 | —230·5 | —188·8 | —223·6 | —251·8 | —160·6 | —245·9 | —166·5 | —215·0 | —197·4 |
| B | 58·5 | 82·8 | 34·2 | — | — | 74·6 | 42·4 | 23·4 | 93·6 | 12·2 | 104·8 | 165·7 | —48·7 |
| C | —18·2 | —0·8 | —35·6 | —2·1 | —34·3 | — | — | —41·6 | 5·2 | 12·0 | —48·4 | —60·1 | 23·7 |
| D | —61·6 | —107·2 | —26·5 | —96·7 | —26·5 | —85·0 | —38·2 | — | — | —109·6 | —13·6 | —13·3 | —109·9 |
| E | 54·6 | 14·9 | 94·3 | 8·3 | 100·9 | 84·8 | 24·4 | 6·6 | 102·6 | — | — | 34·4 | 74·8 |
| I | 17·3 | 8·5 | 26·1 | —26·5 | —89·9 | —24·6 | 59·2 | 65·6 | —31·0 | —2·9 | 37·5 | — | — |

C.D. for mean response of A=107·5 Kg/ha.

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 60(150), 61(133).**

**Site :- Agri. Res. Stn., Naragund.** **Type :- 'C'.**

Object :—To find out suitable time of sowing for Cotton in this tract.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) Alkaline soil. (iii) As per treatments. (iv) (a) 3 harrowings with country blade harrow. (b) Seed-drill in 1960, dibbling in 1961. (c) 9 to 11 Kg/ha. (d) 76 cm. between rows in 1960. 61 cm.×61 cm. in 1961. (e) 2. (v) Nil. (vi) *Laxmi.* (vii) Unirrigated. (viii) 3 interculturings and 1 weeding (1960), interculturing (1961). (ix) 56 cm. ; 49 cm. (x) 21.2.1961 to 28.3.1961 ; 19.2.1962 and 26.3.1962.

2. TREATMENTS :

4 sowing dates : $D_1$=Last week of July, $D_2$=2nd week of August, $D_3$=Last week of August and $D_4$= 2nd week of September.

3. DESIGN :

(i) L. Sq. (ii) (a) 4. (b) N.A. (iii) N.A. (iv) (a) 14·0 m.×9·1 m. (b) 12·5 m.×6·1 m. (v) 76 cm,× 152 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Height, boll count, plant count and yield of *kapas*. (iv) (a) 1958 to 62. (b) No. (c) As under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous. Treatments×years interaction is present. Results for 1958 are available for the *Laxmi* and Jagadhar varieties combined. In 1959, *Laxmi* was not sown on one date. Hense results for three dates are available.

5. RESULTS :

(i) 171 Kg/ha. (ii) 77·0 Kg/ha. based on 3 d.f. made up of Treatments×years interaction. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $D_1$ | $D_2$ | $D_3$ | $D_4$ |
|---|---|---|---|---|
| Av. yield | 204 | 212 | 149 | 118 |

| Years | $D_1$ | $D_2$ | $D_3$ | $D_4$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|
| 1960 | 364 | 364 | 276 | 218 | ** | 306 | 21·5 |
| 1961 | 44 | 60 | 22 | 18 | N.S. | 36 | 25·3 |
| Pooled | 204 | 212 | 149 | 118 | N.S. | 171 | 77·0 |

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 60(151), 61(134).**

**Site :- Agri. Res. Stn., Naragund.** **Type :- 'C'.**

Object :—To find out suitable time of sowing for Cotton in this tract.

1. BASAL CONDITIONS : to 3. DESIGN :

Same as in expt. no. 60(150), 61(133) on page 414.

Here *Jayodhar* variety is tried.

4. GENERAL :

(i) Satisfactory ; Normal. (ii) Nil. (iii) Height, boll count, plant count and yield of *kapas*. (iv) (a) 1958 to 62. (b) No. (c) As under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous. Treatments×years interaction is present.

5. RESULTS :

(i) 135 Kg/ha. (ii) 54·6 Kg/ha. based on 3 d.f. made up of Treatments×years interaction. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $D_1$ | $D_2$ | $D_3$ | $D_4$ |
|---|---|---|---|---|
| Av. yield | 136 | 102 | 149 | 154 |

| Years | $D_1$ | $D_2$ | $D_3$ | $D_4$ | Sig. | G.M. | S.E./plot. |
|---|---|---|---|---|---|---|---|
| 1960 | 246 | 184 | 272 | 278 | N.S. | 245 | 80·2 |
| 1961 | 26 | 19 | 27 | 30 | N.S. | 25 | 13·1 |
| Pooled | 136 | 102 | 149 | 154 | N.S. | 135 | 54·6 |

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**Crop :- Cotton.** **Ref :- Ms. 61(154).**

**Site :- Agri. Res. Stn., Dharwar.** **Type 'CV'.**

Object :— To find out the effect of sowing dates on growth and yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*, Cotton. (b) *Jowar*. (c) Nil. (ii) Black cotton soil. (iii) As per treatments. (iv) 2 ploughings and 3 harrowings. (b) Dibbled in furrows. (c) N.A. (d) 60 cm.×23 cm. (e) 2. (v) Nil. (iv) As per treatments. (vii) Unirrigated. (viii) 3 weedings. (ix) 24 cm. (x) 29.12.61 to 21.4.62.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 3 dates of sowing ; $D_1$=29.7.1961, $D_2$=15.8.1961 and $D_3$=25.6.1961.

(2) 2 varieties : $V_1$=*Laxmi* and $V_2$=Jayadhar.

3. DESIGN :

(i) Fact. in R.B.D, (ii) (a) 6. (b) N.A. (iii) and (iv) N.A. (b) 18·3 m.×11.0 m. (v) 2 rows all round. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 373 Kg/ha. (ii) 53·3 Kg/ha. (iii) Main effect of D alone is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $D_1$ | $D_2$ | $D_3$ | Mean |
|---|---|---|---|---|
| $V_1$ | 415 | 366 | 331 | 371 |
| $V_2$ | 418 | 358 | 348 | 375 |
| Mean | 416 | 362 | 340 | 373 |

C.D. for D marginal means=44·9 Kg/ha.

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**Crop :- Cotton.** **Ref :- Ms. 62(34).**

**Site :- Agri. Res. Stn., Gangavathy.** **Type :- 'CV'.**

Object :—To find the optimum time of sowing for different varieties of Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 251·1 Q/ha. of F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (ii) Light black cotton soil. (iii) As per treatments. (iv) (a) 2 ploughings and 2 harrowings. (b) Dibbling. (c) N.A. (d) As per treatments. (e) N.A. (v) 251·1 Q/ha. of F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (vi) As per treatments. (vii) Irrigated. (viii) 6 hand weedings. (ix) 58 cm. (x) 23.9.1962 to 25.3.63.

2. TREATMENTS :

6 dates of sowing : $D_1$=25.4.1962, $D_2$=10·5.1962, $D_3$=25·5.1962, $D_4$=10.6.1962, $D_5$=20.8.1962 and $D_6$=20.8.1962.

Variety 170—$CO_2$ was sown as in $D_1$ to $D_4$ with spacing 91 cm.×61 cm. Variety *Laxmi* was sown as in $D_5$ and $D_6$ with spacing 91 cm.×30 cm. for $D_5$ and 69 cm.×30 cm. for $D_6$.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) 12·2 m.×5·5 m. (b) 11·0 m.×3·7 m. (v) 61 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Heavy attack of Aphids, Jassids, Boll worm and Black arm. 6 times Endrine was sprayed. (iii) Yield of *kapas*. (iv) (a) and (b) N.A. (c) Nil. (v) Sirugappa. (vi) Season was unfavourable to cotton. Heavy rains and cloudy weather prevailed during bursting period. (vii) Nil.

5. RESULTS :

(i) 1318 Kg/ha. (ii) 369·8 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $D_1$ | $D_2$ | $D_3$ | $D_4$ | $D_5$ | $D_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 1447 | 1831 | 1131 | 973 | 1202 | 1321 |

C. D.=487·9 Kg/ha.

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**Crop :- Cotton.** (*Kharif*). **Ref :- Ms. 64(25).**

**Site :- Agri. Res. Stn., Sirugappa.** **Type :- 'CV'.**

Object :—To study the performance of Sea Island Cotton with other varieties under different sowing dates.

1. BASAL CONDITIONS :

(i) (a) Cotton—Groundnut—Bengal gram. (b) Bengal gram. (c) 125·6 Q/ha. of F.Y.M.+44·8 Kg/ha. of $P_2O_5$ as Super. (ii) Black soil. (iii) As per treatments. (iv) (a) 1 ploughing and 1 harrowing working with hire kunte and ridger. (b) Dibbling by hand. (c) 9 Kg/ha. (d) 76 cm.×30 cm. (e) 2 to 3. (v) 125·6 Q/ha. of F.Y.M. applied before sowing. 28·0 Kg/ha. of N as A/S+112·1 Kg/ha. of $P_2O_5$ as Super+56·0 Kg/ha. of $K_2O$ as Mur. Pot. at the time of sowing. (vi) As per treatments. (vii) Irrigated. (viii) 4 weedings, earthing up once by spades. (ix) 64 cm. (x) 18.9.64 to 11.1.65.

2. TREATMENTS :

**Main-plot treatments** :

3 varieties : $V_1$=170—$CO_2$, $V_2$=Sea island and $V_3$=*Laxmi*.

**Sub-plot treatments** ;

4 dates of sowing : $D_1$=15.4.1964, $D_2$=1.5.1964, $D_3$=15.5.1964 and $D_4$=1.6.1964.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/198 ha. (b) 1/247 ha. (v) One row on either side. (vi) Yes.

4. GENERAL :

(i) The crop was very bad. (ii) The crop was attacked by Red leaf blight disease, Black arms and heavy Boll worms. First sprayed with Folidol and later Endrine with W.P. Sulpher—But not controlled. (iii) Germination percentage and yield of *kapas*. (iv) (a) 1964 N.A. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 333 Kg/ha. (ii) (a) 254·4 Kg/ha. (b) 124·9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $D_1$ | $D_2$ | $D_3$ | $D_4$ | Mean |
|---|---|---|---|---|---|
| $V_1$ | 230 | 202 | 231 | 231 | 223 |
| $V_2$ | 443 | 433 | 224 | 264 | 341 |
| $V_3$ | 485 | 470 | 462 | 317 | 433 |
| Mean | 386 | 368 | 305 | 217 | 333 |

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**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 64(207), 65(80).**

**Site :- Agri. Res. Stn., Bagalkot.** **Type :- 'CM'.**

Object :—To study the effect of different fertilizers and cultural practices on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*–Cotton. (b) *Jowar*. (c) 29·6 Kg/ha. of N+24·7 Kg/ha. of $P_2O_5$. (ii) Deep black soil. (iii) 1.9.1964 ; 2.9.1965. (iv) (a) Wooden ploughing and harrowing. (b) Dibbling. (c) and (d) As per treatments. (e) 1. (v) 12·4 C.L./ha. of F.Y.M. (vi) *Suyodhar*. (vii) Unirrigated. (viii) Weeding, interculturing and thinning. (ix) 61 cm. ; 25 cm. (x) N.A. ; 24.2.1966.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1), (2) and (3)

(1) 2 sowing dates : $D_1$=15 days earlier and $D_1$=Normal date.
(2) 2 spacings : $S_1$=46 cm. and $S_2$=61 cm.
(3) 2 seed rates : $R_1$=6·7 and $R_2$=10·1 Kg/ha.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 2 levels of N : $N_0$=0 and $N_1$=30 Kg/ha.
(2) 2 levels of $P_2O_5$ : $P_0$=0 and $P_1$=30 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 8 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 9·1 m.× 5·5 m. (b) 8·5 m.×4·9 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Bollworm, Jassids, Stel attack. (iii) *Kapas* yield. (iv) (a) 1964-68. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

**64(207)**

(i) 511 Kg/ha. (ii) (a) 121·6 Kg/ha. (b) 89·2 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $S_1$ | $S_2$ | $R_1$ | $R_2$ | $N_0$ | $N_1$ | $P_0$ | $P_1$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $D_1$ | 515 | 538 | 521 | 532 | 491 | 562 | 521 | 533 | 527 |
| $D_2$ | 515 | 475 | 487 | 503 | 470 | 521 | 486 | 504 | 495 |
| Mean | 515 | 507 | 504 | 518 | 480 | 542 | 504 | 518 | 511 |
| $P_0$ | 488 | 519 | 488 | 519 | 464 | 543 | | | |
| $P_1$ | 542 | 495 | 520 | 516 | 497 | 540 | | | |
| $N_0$ | 474 | 486 | 475 | 485 | | | | | |
| $N_1$ | 556 | 527 | 533 | 550 | | | | | |
| $R_1$ | 525 | 483 | | | | | | | |
| $R_2$ | 505 | 530 | | | | | | | |

C. D. for N marginal means=36·7 Kg/ha.

**65(80)**

(i) 311 Kg/ha. (ii) (a) 73·2 Kg/ha. (b) 53·4 Kg/ha. (iii) Main effect of D and interactions D×S and D×R are highly significant. Interaction D×S×R is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $S_1$ | $S_2$ | $R_1$ | $R_2$ | $N_0$ | $N_1$ | $P_0$ | $P_1$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $D_1$ | 361 | 311 | 370 | 302 | 328 | 345 | 338 | 335 | 336 |
| $D_2$ | 248 | 324 | 263 | 309 | 286 | 286 | 286 | 286 | 286 |
| Mean | 304 | 318 | 316 | 306 | 307 | 315 | 312 | 310 | 311 |
| $P_0$ | 303 | 321 | 320 | 304 | 307 | 316 | | | |
| $P_1$ | 306 | 315 | 313 | 308 | 306 | 315 | | | |
| $N_0$ | 297 | 317 | 323 | 291 | | | | | |
| $N_1$ | 312 | 319 | 310 | 321 | | | | | |
| $R_1$ | 296 | 338 | | | | | | | |
| $R_2$ | 313 | 298 | | | | | | | |

C. D. for D marginal means=32·0 Kg/ha.

C. D. for body of D×R or S×R tables=46·7 Kg/ha-

**Crop :- Cotton** (*Rabi*). **Ref :- Ms.62(81), 63(80).**

**Site :- Agri. College Farm, Dharwar.** **Type :- 'CM'.**

Object :—To find the optimum spacing between rows and plants within rows with different levels of fertilizers for Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 28·0 Kg/ha. of N+16.8 Kg/ha. of $P_2O_5$ in two equal doses. (ii) Black soil. (iii) 25.8.62 ; 10.8.63. (iv) (a) 3 harrowings. (b) As per treatments. (c) 11 Kg/ha. (d) As per treatments. (e) 2. (v) 22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$. (vi) *Laxmi*. (vii) Unirrigated. (viii) 3 interculturings and 2 weedings. (ix) 78 cm. ; 79 cm. (x) 21.1.63 to 1.4.63, 8.2.64 to 10.3.64.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 rows spacings : $S_1$=61 cm. and $S_2$=91 cm.

(2) 2 methods of sowing : $D_1$=Drilling and thinning to maintain 30 cm. spacing and $D_2$=Dibbling and thinning to maintain 30 cm. spacing.

(3) 2 manurial treatments : $M_1$=22·4 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$ and $M_2$=44·8 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha.of $K_2O$.

3. DESIGN :

(i) $2^3$ Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) 9·1 m.×7·3 m. (b) 7·3 m.×6·1 m. (v) 91 cm.×61 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Dusted B.H.C. 5% at 16·8 to 22·4 Kg/ha. and sprayed Endrine once. (iii) Height, no. of plants/plot, no. of bolls/plant and yield of *kapas*. (iv) (a) 1962-63. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous. Treatments×years interaction is absent.

5. RESULTS :

**62(81)**

(i) 786 Kg/ha. (ii) 159·2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $D_1$ | $D_2$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|---|
| $S_1$ | 807 | 675 | 713 | 771 | 742 |
| $S_2$ | 801 | 859 | 807 | 852 | 830 |
| Mean | 804 | 767 | 760 | 811 | 786 |
| $M_1$ | 794 | 727 | | | |
| $M_2$ | 814 | 807 | | | |

**63(80)**

(i) 606 Kg/ha. (ii) 37·7 Kg/ha. (iii) Main effect of M and interaction D×M are significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $D_1$ | $D_2$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|---|
| $S_1$ | 602 | 607 | 581 | 628 | 605 |
| $S_2$ | 624 | 590 | 596 | 619 | 607 |
| Mean | 613 | 598 | 588 | 624 | 606 |
| $M_1$ | 616 | 560 | | | |
| $M_2$ | 611 | 636 | | | |

C. D. for M marginal means=23·4 Kg/ha.
C. D. for body of D×M table=33·0 Kg/ha.

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 62(80), 63(79).**

**Site :- Agri. College Farm, Dharwar.** **Type :- 'CM'.**

Object :—To find out the optimum spacing between rows and plants for Cotton with different levels of fertilisers.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 28·0 Kg/ha. of N+16·8 Kg/ha. of P in two equal doses. (ii) Black. (iii) 25.8.62; 10.8.63. (iv) (a) 2 to 3 harrowings. (b) As per treatments. (c) 11 Kg/ha. (d) As per treatments. (e) 2. (v) 22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$. (vi) *Jayadhar*. (vii) Unirrigated. (viii) 3 interculturings and 2 weedings. (ix) 78 cm.; 79 cm. (x) 21.1.63 to 1.4.63; 8.2.64 to 10.3.64.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 row spacings : $S_1$=61 cm. and $S_2$=91 cm.

(2) 2 methods of sowing : $D_1$=Drilling and thinning to maintain 30 cm. spacing and $D_2$=Dibbling and thinning to maintain 30 cm. spacing.

(3) 2 levels of N as A/S : $N_1$=22·4 and $N_2$=44·8 Kg/ha.

3. DESIGN :

(i) $2^3$ Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) 9·1 m.×7·3 m. (b) 7·3 m.×6·1 m. (v) 91 cm. ×61 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Dusted B.H.C. 5% at 16·8 to 22·4 Kg/ha. and sprayed with Endrine once. (iii) Yield of *kapas*. (iv) (a) 1962—63. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous. Treatments×years interaction is absent.

5. RESULTS :

(i) 689 Kg/ha. (ii) 91·2 Kg/ha. (based on 34 d.f. made up of pooled error and Treatments×years interaction). (iii) None of the effects is significant. (iv) Av. yield *kapas* of in Kg/ha.

| | $D_1$ | $D_2$ | $N_1$ | $N_2$ | Mean |
|---|---|---|---|---|---|
| $S_1$ | 706 | 685 | 677 | 715 | 696 |
| $S_2$ | 694 | 670 | 671 | 693 | 682 |
| Mean | 700 | 678 | 674 | 704 | 689 |
| $N_1$ | 692 | 656 | | | |
| $N_2$ | 708 | 700 | | | |

| Years | $S_1$ | $S_2$ | Sig | $D_1$ | $D_2$ | Sig. | $N_1$ | $N_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | 656 | 588 | N.S. | 639 | 604 | N.S. | 621 | 623 | N.S. | 622 | 103·2 |
| 1963 | 736 | 775 | N.S. | 761 | 750 | N.S. | 727 | 784 | N.S. | 755 | 67·6 |
| Pooled | 696 | 682 | N.S. | 700 | 678 | N.S. | 674 | 704 | N.S. | 689 | 91·2 |

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 63(140).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'CM'.**

Object :—To determine suitable date of sowing and spacing and their inter-relation with fertilizer application.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 62·8 Q/ha. of F.Y.M. (ii) Black cotton soil. (iii) As per treatments. (iv) (a) 2 ploughings and cross ploughing, levelling and opening furrows. (b) Dibbled in furrows. (c) N.A. (d) As per treatments. (e) N.A. (v) 62·8 Q/ha. of F.Y.M.+28·2 Kg/ha. of $P_2O_5$+28·2 Kg/ha. $K_2O$. (vi) *Jayadhar*. (vii) Unirrigated (viii) 3 harrowings, 3 weedings. (ix) 41 cm. (x) 14.2.64 to 19.3.64.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1) and (2)

(1) 3 dates of sowing : $D_1$=10 to 15 days before normal sowing (1.8.63), $D_2$=Normal sowing (14.8.63) and $D_3$=10 to 15 days after normal sowing (28.8.63).

(2) 3 spacings : $S_1$=61 cm.×23 cm., $S_2$=61 cm.×30 cm. and $S_3$=61 cm.×46 cm.

**Sub-plot treatments :**

3 levels of N as A/S : $N_0$=0, $N_1$=28·0 and $N_2$=56·0 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 3·7 m.×9·8 m. (v) 2 rows alround. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) to (vii) N.A.

5. RESULTS :

(i) 746 Kg/ha. (ii) (a) 190·0 Kg/ha. (b) 101·0 Kg/ha. (iii) Main effect of N and interaction D×N are significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $D_1$ | $D_2$ | $D_3$ | $S_1$ | $S_2$ | $S_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 639 | 776 | 726 | 718 | 758 | 668 | 715 |
| $N_1$ | 678 | 818 | 680 | 740 | 593 | 743 | 725 |
| $N_2$ | 900 | 773 | 724 | 760 | 917 | 718 | 798 |
| Mean | 739 | 789 | 710 | 739 | 789 | 710 | 746 |
| $S_1$ | 752 | 758 | 708 | | | | |
| $S_2$ | 864 | 771 | 733 | | | | |
| $S_3$ | 645 | 817 | 667 | | | | |

C.D. for N marginal means =70·7 Kg/ha.

C.D. for N means at the same level of D=122.6 Kg/ha.

C.D. for D means at the same level of N=177·0 Kg/ha.

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 62(77).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'CM'.**

Object :—To find out the effect of cultural cum fertilizer treatments on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) Nil. (ii) Medium black cotton soil. (iii) As per treatments. (iv) (a) 2 ploughings and 3 harrowings. (b) Opening 5 cm. furrows and dibbling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) Nil. (ix) 40 cm. (x) 24.2.63 and 22.3.63.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1), (2) and (3)

(1) 2 dates of sowing : $D_1$=11.9.62 and $D_2$=25.9.62.

(2) 3 row spacings : $S_1$=46 cm., $S_2$=61 cm. and $S_3$=91 cm.

(3) 2 seed rates : $R_1$=9 and $R_2$=13 Kg/ha.

**Sub-plot treatments :**

All combinations of (4) and (5)

(4) 2 levels of N : $N_0$=0 and $N_1$=28·0 Kg/ha.

(5) 2 levels of P : $P_0$=0 and $P_1$=28·0 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 12 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 8·2 m.×4·9 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) and (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 780 Kg/ha. (ii) (a) 349·6 Kn/ha. (b) 129·2 Kg/ha. (iii) Main effects of D, N and P are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $R_1$ | $R_2$ | $N_0$ | $N_1$ | $P_0$ | $P_1$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $D_1$ | 904 | 902 | 892 | 899 | 899 | 793 | 1003 | 865 | 932 | 899 |
| $D_2$ | 625 | 645 | 712 | 613 | 709 | 581 | 739 | 610 | 709 | 660 |
| Mean | 765 | 773 | 802 | 756 | 804 | 687 | 871 | 738 | 821 | 780 |
| $P_0$ | 739 | 712 | 764 | 717 | 759 | 650 | 825 | | | |
| $P_1$ | 791 | 833 | 840 | 793 | 850 | 724 | 919 | | | |
| $N_0$ | 662 | 684 | 714 | 675 | 699 | | | | | |
| $N_1$ | 867 | 860 | 889 | 835 | 907 | | | | | |
| $R_1$ | 783 | 761 | 724 | | | | | | | |
| $R_2$ | 749 | 786 | 880 | | | | | | | |

C.D. for D marginal means =102·8 Kg/ha.

C.D. for N or P marginal means=36·9 Kg/ha.

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**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 63(42).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'CM'.**

Object :—To find out suitable spacing, dates of sowing and fertilizers for Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar.* (c) 62·8 Q/ha. of F.Y.M. (ii) Medium black cotton soil. (iii) As per treatments. (iv) (a) 2 ploughings and cross ploughing, levelling and opening furrows. (b) Dibbled in furrows. (c) and (d) As per treatments. (e) N.A. (v) 62·8 Q/ha. of F.Y.M. (vi) *Laxmi.* (vii) Unirrigated. (viii) 3 interculturings and 3 weedings. (ix) 33 cm. (x) 23.2.64 to 3.3.64.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1), (2) and (3)

(1) 2 dates of sowing : $D_1$=10 to 15 days earlier from normal sowing and $D_2$=Normal sowing (25.9.63).

(2) 3 spacings : $S_1$=46 cm., $S_2$=61 cm. and $S_3$=76 cm.

(3) 2 seed rates : $R_1$=9 and $R_2$=13 Kg/ha.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 2 levels of N as A/S : $N_0$=0 and $N_1$=28·0 Kg/ha.

(2) 2 levels of $P_2O_5$ as Super : $P_0$=0 and $P_1$=28·0 Kg/ha.

Manures applied in one dose at sowing.

3. DESIGN :

(i) Split-plot. (ii) (a) 12 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 7·9 m.×5·5 m. (v) 2 rows alround. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas.* (iv) (a) 1963—contd. (Treatments modified every year). (b) No. (c) Nil. (v) Dharwar and Bagalkot. (vi) and (vii) Nil.

5. RESULTS :

(i) 498 Kg/ha. (ii) (a) 245·4 Kg/ha. (b) 105·5 Kg/ha. (iii) Main effects of D and S are significant. N and P effects are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $R_1$ | $R_2$ | $N_0$ | $N_1$ | $P_0$ | $P_1$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $D_1$ | 521 | 655 | 475 | 529 | 572 | 453 | 648 | 538 | 562 | 550 |
| $D_2$ | 434 | 498 | 405 | 408 | 484 | 380 | 512 | 398 | 494 | 446 |
| Mean | 478 | 577 | 440 | 468 | 528 | 416 | 580 | 468 | 528 | 498 |
| $P_0$ | 440 | 539 | 424 | 447 | 488 | 398 | 538 | | | |
| $P_1$ | 514 | 614 | 456 | 489 | 567 | 435 | 621 | | | |
| $N_0$ | 407 | 478 | 364 | 384 | 449 | | | | | |
| $N_1$ | 548 | 675 | 516 | 552 | 607 | | | | | |
| $R_1$ | 425 | 550 | 430 | | | | | | | |
| $R_2$ | 530 | 603 | 450 | | | | | | | |

C.D. for D marginal means =84·8 Kg/ha.
C.D. for S marginal means =103·9 Kg/ha.
C.D. for N or P marginal means=35·1 Kg/ha.

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms 65(114).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'CM'.**

Object :—To study the effect of variations in date of sowing, spacing, fertilizers, seed rate and their interaction on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) *Kharif Jowar*—Cotton. (b) *Kharif Jowar*. (c) 12·4 C.L./ha. of F.Y.M. (ii) Medium black soil. (iii) As per treatments. (iv) (a) 3 wooden ploughings and harrowings. (b) Dibbling. (c) 11·2 Kg/ha. (d) As per treatments. (e) 1. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) 3 weedings. (ix) 25 cm. (x) N.A.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1), (2) and (3)

(1) 2 dates of sowing : $D_1$=10 to 15 days earlier to normal (3.9.65) and $D_2$=Normal date of sowing (29.9.65).

(2) 3 spacings : $S_1$=46, $S_2$=61 and $S_3$=91 cm.

(3) 2 seed rates : $R_1$=9·0 and $R_2$=12·3 Kg/ha.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 2 levels of N : $N_0$=0 and $N_1$=28 Kg/ha.

(2) 2 levels of $P_2O_5$ : $P_0$=0 and $P_1$=28 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 12 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 9·1 m.×5·5 m. (b) 7·9 m.×4·9 m. (v) One row kept. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Boll worms, leaf spot, Dusty cotton bugs—Endrine sprayed. (iii) *Kapas* yield. (iv) (a) 1962—contd. (Treatments modified every year, data for 64 N.A). (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 676 Kg/ha. (ii) (a) 220.5 Kg/ha. (b) 124·9 Kg/ha. (iii) Main effect of D and interaction S×D×R are highly significant. Interaction S×D is significant. (iv) Av. yield of *kapas* in Kg/ha.

|  | $S_1$ | $S_2$ | $S_3$ | $R_1$ | $R_2$ | $N_0$ | $N_1$ | $P_0$ | $P_1$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $D_1$ | 888 | 769 | 918 | 860 | 857 | 830 | 887 | 887 | 830 | 858 |
| $D_2$ | 512 | 547 | 425 | 523 | 466 | 484 | 505 | 462 | 527 | 494 |
| Mean | 700 | 658 | 671 | 691 | 661 | 657 | 696 | 674 | 679 | 676 |
| $P_0$ | 691 | 664 | 667 | 692 | 656 | 671 | 677 |  |  |  |
| $P_1$ | 709 | 652 | 675 | 690 | 667 | 643 | 715 |  |  |  |
| $N_0$ | 682 | 667 | 662 | 691 | 623 |  |  |  |  |  |
| $N_1$ | 718 | 649 | 720 | 691 | 700 |  |  |  |  |  |
| $R_1$ | 725 | 687 | 662 |  |  |  |  |  |  |  |
| $R_2$ | 675 | 630 | 680 |  |  |  |  |  |  |  |

C.D. for D marginal means =76·2 Kg/ha.
C.D. for the body of S×D table=152·8 Kg/ha.

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 60(163).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'CM'.**

Object :—To study the effect of different dates of sowing and application of manure on the growth and yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) Nil. (ii) Medium black cotton soil. (iii) As per treatments. (iv) (a) 2 ploughings and 3 harrowings. (b) Dibbling in furrows. (c) 9 Kg/ha. (d) 61 cm. between rows. (e) 2. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) 3 weedings. (ix) 93 cm. (x) 16.2.61 to 27.3.61.

2. TREATMENTS :

**Main-plot treatmemts :**

3 dates of sowing : $D_1$=7.9.60, $D_2$=25.9.60 and $D_3$=7.10.60.

**Sub-plot treatments :**

2 levels of N as A/S : $N_0$=0 and $N_1$=22·4 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10·4 m.×6·1 m. (b) 9·1 m.×4·9 m. (v) 61 cm.×61 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1952—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 363 Kg/ha. (ii) (a) 125·8 Kg/ha. (b) 61·8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $D_1$ | $D_2$ | $D_3$ | Mean |
|---|---|---|---|---|
| $N_0$ | 385 | 352 | 367 | 368 |
| $N_1$ | 389 | 346 | 340 | 358 |
| Mean | 387 | 349 | 353 | 363 |

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 60(165).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'CM'.**

Object :—To find out the effect of spacing between plants and rows, with different numbers of seedlings/hill on the growth and yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) Nil. (ii) Black cotton soil. (iii) 4.10.60. (iv) (a) Ploughing by wooden plough once and 3 harrowings by black harrow. (b) Dibbled in furrows. (c) N A. (d) and (e) As per treatments. (v) 7·4 C.L./ha. of F.Y.M. (vi) *Laxmi*. (vii) Unirrigated. (viii) 3 weedings and 3 interculturings. (ix) 25 cm. (x) 17.2.61 to 27.3.61.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 2 spacings : $S_1$=61 cm. × 30 cm. and $S_2$=30 cm. × 30 cm.
(2) 2 number of seedlings : $H_1$=2 and $H_2$=1 seedling/hole.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) 19·4 m. × 10·3 m. (iii) 8. (iv) (a) 10·3 m. × 4·9 m. (b) 9·1 m. × 3·7 m. (v) 60 cm. × 60 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 986 Kg/ha. (ii) 310·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $S_1$ | $S_2$ | Mean |
|---|---|---|---|
| $H_1$ | 981 | 1008 | 995 |
| $H_2$ | 814 | 1139 | 976 |
| Mean | 898 | 1074 | 986 |

**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 60(144), 61(137), 62(119).**

**Site :- Agri. Res. Stn., Naragund. Type :- 'CM'.**

Object :—To study the effect of dibbling and concentrated effect of manuring on the yield of Cotton.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) *Jowar*; Cotton in 1961 and 62. (c) Nil. (ii) Alkaline soil. (iii) 15.9.60; 12.10.61; 15.9.62. (iv) (a) Harrowing by country blade harrow. (b) As per treatments. (c) 9 Kg/ha. (d) 61 cm.×61 cm. (e) 2. (v) Nil. (vi) *Jayadhar* (medium). (vii) Unirrigated. (viii) 3 interculturings and 1 weeding, digging pits for spot manuring (1960); interculturings with blade hoe (1961) and 2 interculturings by entire hoe (1962). (ix) 56 cm.; 49 cm. ; 82 cm. (x) 24.2.61 to 24.3.61; 21.3.62 to 6.4.62; 21.3.63.

2 TREATMENTS :

All combinations of (1) and (2)+one extra treatment

(1) 2 methods of sowing : $S_1$=Drilling and $S_2$=Spot dibbling.

(2) 3 manurial treatments : $M_0$=Control, $M_1$=12·4 C.L./ha. of F.Y.M. and $M_2$=N, P, K equivalent to 12·4 C.L./ha. of F.Y.M.

Extra treatment : E=12·4 C.L./ha. of F.Y.M.+22·4 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$, dibbling in spots.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 7·6 m.×7·6 m. (b) 6·1 m.×6·1 m. (v) 76 cm.× 76 cm. (vi) Yes.

4. GENERAL :

(i) Germination highly defective in dibbled plots. (ii) Nil. (iii) Plant height, boll count and yield of *kapas*. (iv) (a) 1960 to 62. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous. Treatments×years interaction is absent.

5. RESULTS :

(i) 217 Kg/ha. (ii) 84·8 Kg/ha. (based on 20 d.f. made up of pooled error and Treatment×years interaction). (iii) Extra vs. others effect is significant. Interaction S×M is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

E=270 Kg/ha.

| | $M^0$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|
| $S_1$ | 167 | 206 | 300 | 225 |
| $S_2$ | 187 | 241 | 150 | 193 |
| Mean | 177 | 224 | 225 | 209 |

C.D. for extra vs. others =52·8 Kg/ha.
C.D. for body of S×M table=69·2 Kg/ha.

| Years | $M_0$ | $M_1$ | $M_2$ | Sig. | $S_1$ | $S_2$ | Sig. | Control | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 202 | 270 | 306 | N.S. | 300 | 219 | N.S. | 357 | 273 | 81·7 |
| 1961 | 102 | 121 | 100 | N.S. | 90 | 126 | N.S. | 134 | 112 | 65·0 |
| 1962 | 228 | 280 | 269 | N.S. | 284 | 234 | N.S. | 320 | 268 | 90·2 |
| Pooled | 177 | 224 | 225 | N.S. | 225 | 193 | N.S. | 270 | 217 | 84·8 |

**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 63(113), 64(98), 65(102).**

**Site :- Agri. Res. Stn., Naragund.** **Type :- 'CM'.**

Object :—To study the effect of different methods of sowing and manuring on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) As per treatments. (ii) Alkaline. (iii) 5.10.63; 23.9.64; 28.9.65. (iv) (a) Harrowing by country blade harrow. (b) As per treatments. (c) N.A. ; N.A.; 11 Kg/ha. (d) 76 cm.×76 cm.; 61 cm. between rows in 1964;61 cm. in lines for drilling and 30 cm.×61 cm. in dibbled plots (1965). (e) N.A. (v) Nil. (vi) *Jayadhar* (medium). (vii) Unirrigated. (viii) 2 interculturings by entire hoe (1963) and (1965) ; 2 hand weedings and 3 interculturings for 64. (ix) 58 cm.; N.A., 37 cm. (x) 9.2.64; 8.3.65 to 8.4.65; 23.2.66 and 13.3.66.

2. TREATMENTS :

9 cultural and manurial treatments : $T_1$=Sowing 61 cm. apart by drilling, $T_2$=Sowing 61 cm. apart by dibbling, $T_3=T_1+12·4$ C.L./ba. of F.Y.M., $T_4=T_2+12·4$ C.L./ha. of F.Y.M., $T_5=T_1$+NPK equivalent to 12·4 C.L./ha. of F.Y.M., $T_6=T_2$+NPK equivalent to 12·4 C.L./ha. of F.Y.M., $T_7=T_1+12·4$ C.L./ha. of F.Y.M.+22·4 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$, $T_8=T_3+12·4$ C.L./ha. of F.Y.M.+56 Kg/ha. of Sulphur +11·2 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$ and $T_9=T_2+12·4$ C.L./ha. of F.Y.M.+11·2 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$+125·5 Q/ha. of sand.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 7·6 m.×7·6 m. (b) 6·1 m.×6·1 m. (vi) 76 cm.×76 cm. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Plant height, boll count and *kapas* yield. (iv) (a) 1960—N.A. (b) Yes. (c) As under 5. Results. (v) N.A. (vi) Nil. (vii) Yield of *kapas* for $T_1$ to $T_6$ given for 1963 only.

5. RESULTS :

**63(113)**

(i) 334 Kg/ha. (ii) 73·1 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_7$ |
|---|---|---|---|---|---|---|
| Av. yield | 370 | 217 | 311 | 323 | 466 | 254 |

C.D.=106·7 Kg/ha.

**64(98)**

(i) 339 Kg/ha. (ii) 138·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 244 | 389 | 194 | 248 | 431 | 486 | 392 | 345 | 324 |

**65(102)**

(i) 147 Kg/ba. (ii) 60·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 123 | 172 | 118 | 187 | 156 | 124 | 108 | 182 | 150 |

**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 62(61), 64(30).**

**Site :- Agri. Res. Stn., Siruguppa.** **Type :- 'CM'.**

Object :—To determine the suitable dates of sowing and spacing and their interaction with fertilizer application.

1. BASAL CONDITIONS :

(i) (a) *Jowvr*—Cotton. (b) *Jowar*. (c) 125·6 Q/ha. of F.Y.M.+44·8 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super. (ii) Deep black cotton soil ; deep black soil. (iii) As per treatments. (iv) (a) Working with hire kunte and ridger and sarma kunte in 62 and 64; Ploughing with victory plough in 64. (b) Dibbling. (c) N.A.; 10 Kg/ha. (d) As per treatments. (e) N.A.; 2. (v) 56·0 Kg/ha. of $P_2O_5$ as Super+56·0 Kg/ha. of $K_2O$ as Pot. Sul. applied before dibbling the seeds. (vi) *Laxmi*. (vii) Irrigated. (viii) 2 weedings, working with cultivation and ridger. (ix) 50 cm.; 29 cm. (x) 25.3.63; 2.2.65 to 9.4.65.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1) and (2)

(1) 3 dates of sowing : $D_1$=1st August, $D_2$=15th August and $D_3$=30th August.

(2) 3 spacings : $S_1$=23 cm., $S_2$=30 cm. and $S_3$=38 cm.

**Sub-plot treatments :**

3 levels of N : $N_0$=0. $N_1$=56·0 and $N_2$=112·1 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 1/198 ha. (b) 1/247 ha. (v) 1 row on either side. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Jassids were noticed. Endrine was sprayed to control them. Red leaf blight was also noticed during the crop growth. (iii) No. of first opened bolls, good and bad boll opening, final population counts and *kapas* yield. (iv) (a) 1962 to 64 (Treatments were modified in 63). (b) No. (c) As under 5. Resuts. (v) N.A. (vi) Nil. (vii) Dates of sowing in 1963 differ. It has not taken into consideration while pooling. Main plot error variances for the years 1962 and 64 are homogeneous. Main-plot Treatments × years interaction is absent and sub-plot error variances are homogeneous.

5. RESULTS :

**62(61)**

(i) 765 Kg/ha. (ii) (a) 325·4 Kg/ha. (b) 148·3 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $D_1$ | $D_2$ | $D_3$ | $N_0$ | $N_1$ | $N_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $S_1$ | 773 | 707 | 769 | 709 | 865 | 675 | 749 |
| $S_2$ | 1033 | 781 | 724 | 788 | 947 | 803 | 846 |
| $S_3$ | 779 | 825 | 494 | 672 | 751 | 675 | 699 |
| Mean | 861 | 771 | 662 | 723 | 855 | 718 | 765 |
| $N_0$ | 773 | 709 | 687 | | | | |
| $N_1$ | 974 | 850 | 739 | | | | |
| $N_2$ | 838 | 754 | 561 | | | | |

C.D. for N marginal means=103·8 Kg/ha.

**64(30)**

(i) 1162 Kg/ha. (ii) (a) 114·8 Kg/ha. (b) 94·4 Kg/ha. (iii) Main effects of D and N are highly significant. Main effect of S and interactions D×N and D×S×N are significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $D_1$ | $D_2$ | $D_3$ | $N_0$ | $N_1$ | $N_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $S_1$ | 1296 | 1174 | 1131 | 1007 | 1205 | 1386 | 1200 |
| $S_2$ | 1313 | 1176 | 1084 | 973 | 1330 | 1270 | 1191 |
| $S_3$ | 1278 | 1071 | 934 | 918 | 1152 | 1213 | 1094 |
| Mean | 1296 | 1141 | 1050 | 966 | 1229 | 1291 | 1162 |
| $N_0$ | 1064 | 966 | 868 | | | | |
| $N_1$ | 1310 | 1192 | 1185 | | | | |
| $N_2$ | 1513 | 1263 | 1096 | | | | |

C.D. for D or S marginal means =88.3 Kg/ha.
C.D. for N marginal means =66·2 Kg/ha.
C.D. for two N means at the same level of D=114·5 Kg/ha.
C.D. for two D means at the same level of N=128·4 Kg/ha.

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**Crop :- Cotton. (*Rabi*).** **Ref :- Ms. 63(141).**

**Site :- Agri. Res. Stn., Siruguppa.** **Type :- 'CM'.**

Object :—To determine suitable dates of sowing and spacing and their relation with fertilizer application.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 125·5 Q/ha. of F.Y.M.+44·8 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super. (ii) (a) Medium black. (b) N.A. (iii) As per treatments. (iv) (a) 2 ploughings, once harrowing, formed ridges. (b) Hand dibbling. (c) 11 Kg/ha. (d) As per treatments. (e) 2. (v) 56 Kg/ha. of $P_2O_5$+56 Kg/ha. of $K_2O$ mixed and applied through seed drill before sowing. (vi) *Laxmi*. (vii) Irrigated. (viii) Thinning and weeding and working with cultivator. (ix) 44 cm. (x) 17.2,64 to 26.3.64.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1) and (2)

(1) 3 dates of sowing : $D_1$=10.8.1963, $D_2$=20.8.63 and $D_3$=30.8.1963.

(2) 3 spacings : $S_1$=23 cm., $S_2$=30 cm. and $S_3$=38 cm.

**Sub-plot treatments :**

3 levels of N as A/S : $N_0$=0, $N_1$=56·0 and $N_2$=112·1 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 9·1 m. ×5·5 m. (b) 6·7 m.×4·9 m. (v) 122 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Bad boll opening more. (ii) Aphids, jassids, thrips and black arm—sprayed with Endrine six times. (iii) Yield and boll count. (iv) (a) 1962-64. (b) No. (c) Nil. (v) Dharwar. (vi) Nil. (vii) Sowing dates differ in 1963.

5. RESULTS :

(i) 495 Kg/ha. (ii) (a) 166·4 Kg/ha. (b) 142·5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

|  | $S_1$ | $S_2$ | $S_3$ | $N_0$ | $N_1$ | $N_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $D_1$ | 526 | 524 | 447 | 421 | 550 | 526 | 499 |
| $D_2$ | 581 | 510 | 493 | 532 | 535 | 517 | 528 |
| $D_3$ | 451 | 505 | 420 | 501 | 479 | 396 | 459 |
| Mean | 519 | 513 | 453 | 485 | 521 | 480 | 495 |
| $N_0$ | 519 | 509 | 426 |  |  |  |  |
| $N_1$ | 525 | 550 | 489 |  |  |  |  |
| $N_2$ | 514 | 479 | 445 |  |  |  |  |

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 61 to 63 (M.A.E.).**

**Site :- M.A.E. Centre, Gangavati.** **Type :- 'CM'.**

Object :—Type (viii) : To study the effect of cultural practices along with different levels of N and P on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Bengal Gram for 61. N.A. for other years. (c) 11·2 Kg/ha. of N as A/S for 61. N.A. for other years. (ii) Medium black. (iii) As per treatments. (iv) (a) 1 ploughing and 4 harrowings. (b) Dibbling. (c) As per treatments. (d) N.A. (e) Nil. (v) 5604 Kg/ha. of F.Y.M. (vi) *Laxmi.* (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) N.A. (x) 4 pickings from 18.1.62 to 22.3.62 ; N.A. ; 4.2.64.

2. TREATMENTS :

**Main-plot treatments :**
All combinations of (1) and (2)
(1) 3 dates of sowing : $D_1$=Early, $D_2$=Normal and $D_3$=Late.
(2) 3 seed rates : $S_1$=56·0, $S_2$=78·4 and $S_3$=100·9 Kg/ha.

**Sub-plot treatments :**
All combinations of (1) and (2)
(1) 3 levels of N as A/S : $N_0$=0, $N_1$=22·4 and $N_2$=44·8 Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_0$=0, $P_1$=22·4 and $P_2$=44·8 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) 9 main-plots/replication and 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Continuously attacked by Aphids and Thrips, sprayings with Folidol. (iii) Yield of *kapas.* (iv) (a) 1961-63. (b) N.A. (c) N.A. (v) Nil. (vi) N.A. (vii) P marginal means are N.A.

5. RESULTS :

**61(MAE)**

(i) 926. (ii) (a) aud (b) N.A. (iii) Main effects of D, S and N are significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $S_1$ | $S_2$ | $S_3$ | $D_1$ | $D_2$ | $D_3$ | $N_0$ | $N_1$ | $N_2$ |
|---|---|---|---|---|---|---|---|---|---|
| Mean yield | 1035 | 885 | 858 | 1177 | 946 | 655 | 855 | 990 | 933 |

**62(MAE)**

(i) 714 Kg/ha. (ii) (a) and (b) N.A. (iii) Main effects of D, S and N are significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $S_1$ | $S_2$ | $S_3$ | $D_1$ | $D_2$ | $D_3$ | $N_0$ | $N_1$ | $N_2$ |
|---|---|---|---|---|---|---|---|---|---|
| Mean yield | 866 | 615 | 663 | 692 | 899 | 553 | 642 | 757 | 744 |

**63(MAE)**

(i) 597 Kg/ha. (ii) (a) and (b) N.A. (iii) Main effects of D and N are significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $S_1$ | $S_2$ | $S_3$ | $D_1$ | $D_2$ | $D_3$ | $N_0$ | $N_1$ | $N_2$ |
|---|---|---|---|---|---|---|---|---|---|
| Mean yield | 643 | 616 | 532 | 697 | 588 | 506 | 494 | 629 | 668 |

— — —

**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 61(74), 62(58), 63(37).**

**Site :- Agri. Res. Stn., Siruguppa.** **Type :- 'I'.**

Object :—To study the effect of time and freqnency of irrigation with respect to yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 125·6 Q/ha. of F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ in 1961 and 1963 ; 24·7 C.L./ha. of F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ in 1962. (ii) Black cotton soil. (iii) 27.8.1961 ; 14.8.1962 ; 20.8.1963. (iv) (a) Ploughing, harrowing and passing ridger in 1961, 1963, 3 harrowings in 1962. (b) Dibbling. (c) 7 Kg/ha. in 1961 ; 10 Kg/ha. in 1962 ; 8 to 10 Kg/ha. in 1963. (d) 46 cm. between rows in 1961 ; 61 cm.×30 cm. in 1962 ; 69 cm.×30 cm. in 1963. (e) N.A. in 1961, 1962 and 1 in 1963. (v) 125·6 Q/ha. of F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. ($P_2O_5$ and F.Y.M. as basal dose, N in two split doses ½ at sowing and ½ at 40 days after sowing). (vi) *Laxmi*. (vii) As per treatments. (viii) Earthing and weeding in 1961 ; weeding, thinning and intercultivation in 1962 ; weeding, passing cultivator and ridger in 1963. (ix) 24 cm. ; 54 cm. ; 27 cm. (x) 22.1.1962 to 14.3.1962 ; 29.1.1963 to 9.4.1963 ; 3.2.1964 to 9.3.1964.

2. TREATMENTS :

**Main-plot treatments :**

4 irrigations : $I_0$=control (no irrigation), $I_1$=7, $I_2$=9 and $I_3$=12 irrigations.

**Sub-plot treatments :**

3 last dates of irrigation : $D_1$=15th December, $D_2$=1st Jan. and $D_3$=15th Jan.

4. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. ; 15.5 m.×7·3 m. ; N.A. (iii) 3 ; 4 ; 4. (iv) (a) 9·6 m.×7·3 m. ; 8·2 m.×7·3 m. ; 9·1 m.×5·5 m. (b) 6·9 m.×6·7 m. ; 6·1 m.×5·5 m. 6·1 m.×4·1 m. (v) 137 cm.×30 cm ; 137 m.×61 cm ; 152 cm.×69 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Incidence of thrips and red leaf blight disease observed in 1961. Attack of Jassids and aphids, severe attack of thrips in 1962. Severe attack of aphids in 1963. Thrips and jassids also noticed. Black worm and red leaf blight disease also observed. Control measure taken by syraying endrine. (iii) Height and breadth of the plant, yield of *kapas*. (iv) (a) 1961—N.A. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Both the error variances are heterogeneous.

5. RESULTS :

**61(74)**

(i) 1289 Kg/ha. (ii) (a) 176·6 Kg/ha. (b) 157·0 Kg/ha. (iii) Control vs. irrigation effect is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=1163 Kg/ha.

| | $I_1$ | $I_2$ | $I_3$ | Mean |
|---|---|---|---|---|
| $D_1$ | 1378 | 1318 | 1414 | 1370 |
| $D_2$ | 1540 | 1432 | 1258 | 1410 |
| $D_3$ | 1394 | 1368 | 1384 | 1382 |
| Mean | 1437 | 1373 | 1352 | 1387 |

C. D. for the comparison of control vs. irrigations=133·2 Kg/ha.

62(58)

(i) 976 Kg/ha. (ii) (a) 144·1 Kg/ha. (b) 168·9 Kg/ha. (iii) Main effect of I alone is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=937 Kg/ha.

| | $I_1$ | $I_2$ | $I_3$ | Mean |
|---|---|---|---|---|
| $D_1$ | 953 | 1071 | 864 | 1001 |
| $D_2$ | 1079 | 1136 | 782 | 1172 |
| $D_3$ | 971 | 1308 | 733 | 793 |
| Mean | 1001 | 1172 | 1004 | 976 |

C. D. for I marginal means=181·1 Kg/ha.

63(37)

(i) 486 Kg/ha. (ii) (a) 184·4 Kg/ha. (b) 107·3 Kg/ha. (iii) Control vs. irrigation effect is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=333 Kg/ha.

| | $I_1$ | $I_2$ | $I_3$ | Mean |
|---|---|---|---|---|
| $D_1$ | 525 | 497 | 573 | 532 |
| $D_2$ | 475 | 492 | 464 | 477 |
| $D_3$ | 470 | 479 | 549 | 494 |
| | 490 | 489 | 529 | 503 |

C. D. for the comparison of control vs. irrigations=139·0 Kg/ha.

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**Crop :- Cotton.** **Ref :- Ms· 60(276).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'IM'.**

Object :—To find out optimum water and manurial requirements for Cotton under irrigated condition.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Gram. (b) Gram. (c) 22·4 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super. (ii) Black mixed kirl (alkaline). (iii) 30.5.60. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) 9 Kg/ha, (d) 91 cm.×91 cm. (e) 3 to 4 seeds/hill, thinned to one. (v) 12·4 C.L./ha. of F.Y.M. spread and mixed by harrowing. (vi) 170 $CO_2$ (9 month duration). (vii) As per treatments. (viii) Intercultivation by blade hoe and hand weeding. (ix) 58 cm. (x) 26.10.60 to 8.4.61.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 irrigation levels : $I_1=6{\cdot}4$ ha. cm. and $I_2=8{\cdot}9$ ha. cm.

(2) 5 manurial treatments : $M_0$=No manure, $M_1=33{\cdot}6$ Kg/ha. of N as A/S and G.N.C. in 1 : 2 ratio ; $M_2=M_1+16{\cdot}8$ Kg/ha. of $P_2O_5$ as Super+16·8 Kg/ha. of $K_2O$ as Pot. Sul. ; $M_3$=Twice of $M_1$ and $M_4$=Twice of $M_2$,

1st dose : ½ N+full dose of $P_2O_5$ and $K_2O$ 3 weeks after planting.
2nd dose : Rest of N, 8 weeks after planting.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 9·1 m.×7·3 m. (b) 7·3 m.×5·5 m. (v) One row alround. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) *kapas* yield. (iv) (a) 1959—N.A. (b) Yes. (c) Nil. (v) to (vi) Nil.

5. RESULTS :

(i) 1966 Kg/ha. (ii) 271·9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|---|
| $I_1$ | 1907 | 1994 | 2182 | 2049 | 1772 | 1981 |
| $I_2$ | 1884 | 1985 | 2058 | 1987 | 1837 | 1950 |
| Mean | 1896 | 1990 | 2120 | 2018 | 1804 | 1966 |

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 60(124).**

**Site :- Agri. Res. Stn., Dhadesauger.** **Type :- 'IM'.**

Object :— To study the N, P and irrigation requirements for *Laxmi* Cotton to get maximum yield.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar.* (c) N.A. (ii) Medium black soil. (iii) 26 and 27.8.1960. (iv) (a) Ploughing with victory plough and country harrow. (b) Dibbling. (c) N.A. (d) 61 cm.×30 cm. (e) 2 to 3. (v) N.A. (vi) *Laxmi.* (vii) As per treatments. (viii) 2 to 3 hand weedings. (ix) 36 cm. (x) 6 to 29.3.1961.

2. TREATMENTS :

**Main-plot treatments :**

4 levels of irrigation : $I_0=0$, $I_1=3$, $I_2=6$ and $I_3=9$ irrigations.

**Sub-plot treatments :**

(1) 5 levels of N as A/S : $N_0=0$, $N_1=22{\cdot}4$, $N_2=44{\cdot}8$, $N_3=67{\cdot}2$ and $N_4=89{\cdot}7$ Kg/ha.

(2) 5 levels of $P_2O_5$ as Super : $P_0=0$, $P_1=11{\cdot}2$, $P_2=22{\cdot}4$, $P_3=33{\cdot}6$ and $P_4=44{\cdot}8$ Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 25 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) and (b) 6·1 m.×6·0 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) There was severe attack of red leaf, thrips, jassids and aphids—controlled by spraying and folidol and Endrex. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 624 Kg/ha. (ii) (a) 141·5 Kg/ha. (b) 166·5 Kg/ha. (iii) Main effect of I, N and P are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $P_3$ | $P_4$ | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $N_4$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $I_0$ | 354 | 349 | 369 | 393 | 340 | 359 | 347 | 395 | 365 | 338 | 361 |
| $I_1$ | 532 | 580 | 636 | 635 | 696 | 514 | 669 | 682 | 619 | 596 | 616 |
| $I_2$ | 554 | 739 | 705 | 837 | 837 | 644 | 655 | 881 | 741 | 752 | 735 |
| $I_2$ | 581 | 718 | 864 | 886 | 883 | 629 | 675 | 836 | 906 | 884 | 786 |
| Mean | 505 | 596 | 644 | 688 | 689 | 536 | 587 | 699 | 657 | 642 | 624 |
| $N_0$ | 378 | 551 | 573 | 611 | 569 | | | | | | |
| $N_1$ | 555 | 577 | 569 | 618 | 615 | | | | | | |
| $N_2$ | 545 | 683 | 724 | 811 | 730 | | | | | | |
| $N_3$ | 484 | 600 | 736 | 730 | 738 | | | | | | |
| $N_4$ | 564 | 572 | 616 | 668 | 793 | | | | | | |

C.D. for I marginal means =90·1 Kg/ha.

C.D. for N or P marginal means =74·1 Kg/ha.

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**Crop :- Cotton.** **Ref :- Ms. 61(101), 62(102).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'IC'.**

Object :— To find out the best spacings and irrigation requirements for Cotton.

1. BASAL CONDITIONS :

(i) (a) Wheat, Gram—Cotton ; Cotton—*Jowar* and *Maize*. (b) Wheat and Gram ; *Jowar* and *Maize*. (c) 12·4 C.L./ha. of F.Y.M.+22·4 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$+11·2 Kg/ha. of $K_2O$. (ii) Black soil ; black mixed kirl. (iii) 10.6.1961 ; 10.6.1962. (iv) (a) 9 ploughings and harrowing. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) 12·4 C.L./ha. of F.Y.M. (vi) $CO_2$—170. (vii) As per treatments. (viii) 2 interculturings and 5 to 6 weedings. (ix) 32 cm. ; 63 cm. (x) 14.11.1961 to 2.4.1962 ; 17.11.1962 to 22.4.1963.

2. TREATMENTS :

**Main-plot treaments :**

3 intervals of irrigation : $M_1$=20, $M_2$=25 and $M_3$=30 days.

**Sub-plot treatments :**

All combinations of (1) and (2).

(1) 3 spacings : $S_1$=122 cm.×91 cm. ; $S_2$=122 cm.×122 cm. and $S_3$=91cm.×91 cm.

(2) 2 doses of irrigation : $I_1$=5 cm. and $I_2$=8 cm./turn.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 11·0×7·3 m. (b) 7·3 m.×3·7 m. (v) 183 cm.×183 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Aphids, jassids, bollworm, controlled by spraying with folidol and endrine. (iii) Yield of *kapas*, (iv) (a) 1961 to 1963. (Design changed in 1963). (b) No. (c) Nil. (v) and (vi) Nil. (vii) Errors variances due to Main plot are heterogeneous, main-plot Treatments×years interactions is absent.

5. RESULTS:

**61(101)**

(i) 1736 Kg/ha. (ii) (a) 221·9 Kg/ha. (b) 234·9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha .

| | $S_1$ | $S_2$ | $S_3$ | $M_1$ | $M_2$ | $M_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $I_1$ | 1881 | 1604 | 1683 | 1678 | 1656 | 1784 | 1706 |
| $I_2$ | 1836 | 1769 | 1695 | 1611 | 1705 | 1982 | 1767 |
| Mean | 1833 | 1687 | 1690 | 1644 | 1680 | 1883 | 1736 |
| $M_1$ | 1720 | 1742 | 1473 | | | | |
| $M_2$ | 1841 | 1574 | 1631 | | | | |
| $M_3$ | 1937 | 1745 | 1967 | | | | |

**62(102)**

(i) 2006 Kg/ha. (ii) (a) 1654·6 Kg/ha. (b) 304·7 Kg/ha. (iii) Main effect of S alone is highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $M_1$ | $M_2$ | $M_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $I_1$ | 2100 | 1594 | 2368 | 1975 | 2094 | 1993 | 2021 |
| $I_2$ | 1996 | 1502 | 2477 | 1794 | 2071 | 2110 | 1992 |
| Mean | 2048 | 1548 | 2423 | 1885 | 2082 | 2051 | 2006 |
| $M_1$ | 1754 | 1499 | 2401 | | | | |
| $M_2$ | 2282 | 1692 | 2273 | | | | |
| $M_3$ | 2107 | 1453 | 2594 | | | | |

C.D. for S marginal means=207·5 Kg/ha.

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**Crop .- Cotton (*Kharif*).** **Ref :- Ms. 63(167).**

**Site :- Agri. Res. Stn., Arbhavi.** **Type :- 'IC'.**

Object :— To study the interval and depth of irrigation and spacing on the yield of Coteon.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 56 Q/ha. of Farm compost+67·2 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+33·6 Kg/ha. of $K_2O$. (ii) Black alkaline soil. (iii) 4.6.63. (iv) (a) Ploughing, harrowing and clod crushing. (b) Dibbiing. (c) 4·9 Kg/ha. (d) As per treatments. (e) 2. (v) 89·6 Q/ha. of F.Y.M.+33·6 Kg/ha. of N+16·8 Kg/ha. of $P_2O_5$+16·8 Kg/ha. of $K_2O$. (vi) 173 $CO_2$ (mid late). (vii) Irrigated. (viii) Interculturing and hand weeding. (ix) 40 cm. (x) April, 1964.

2. TREATMENTS :

**Main-plot treatments :**

3 intervals of irrigation : $M_1$=20, $M_2$=25 and $M_3$=30 days.

**Sub-plot treatments :**

3 spacings : $S_1$=122 cm.×91 cm. ; $S_2$=122 cm.×122 cm. and $S_3$=91 cm.×91 cm.

**Sub-sub-plot treatments :**

2 intensities of irrigations : $I_1$=12·5 cm. over a ha. and $I_2$=18·8 cm. over a ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot ; 2 sub-sub plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) 11·0 m.×7·3 m. (b) 7·3 m.×3·7 m. (v) 182 cm.×182 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *Kapas.* (iv) (a) 1961 to 1963 (design modified in 1963). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1096 Kg/ha. (ii) (a) 643·9 Kg/ha, (b) 181·6 Kg/ha. (c) 243·6 Kg/ha. (iii) Main effect of S is highly significant. (iv) Av. yield of *Kapas* in Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $I_1$ | $I_2$ | Mean |
|---|---|---|---|---|---|---|
| $S_1$ | 1083 | 980 | 1248 | 1054 | 1153 | 1104 |
| $S_2$ | 937 | 883 | 1040 | 909 | 998 | 953 |
| $S_3$ | 1114 | 1345 | 1234 | 1328 | 1133 | 1231 |
| Mean | 1045 | 1069 | 1174 | 1097 | 1095 | 1096 |
| $I_1$ | 1022 | 1130 | 1140 | | | |
| $I_2$ | 1068 | 1008 | 1207 | | | |

C.D. for S marginal means=131·8 Kg/ha.

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**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 60(84).**

**Site :- Agri. Res. Stn., Gangavati.** **Type :- 'IC'.**

Object :— To find out optimum time of sowing and the intervals of irrigation required for *Laxmi* Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 12·4 C L./ha. of F.Y.M. (ii) Light black soil. (iii) As per treatments. (iv) (a) 2 ploughings and 4 harrowings. (b) Dibbling. (c) N.A. (d) 91 cm.×61 cm. (e) N.A. (v) 12·4 C.L./ha. of F.Y.M. (vi) *Laxmi* (medium). (vii) As per treatments. (viii) 2 hand weedings and hoeing. (ix) N.A. (x) 15.2.61.

2. TREATMENTS :

Treatments in one direction :

10 sowing dates : $D_1$=2nd week of Oct. 1961, $D_2$=3rd week of Oct. 1961, $D_3$=4th week of Oct. 1961, $D_4$=1st week of Nov. 1961, $D_5$=2nd week of Nov. 1961, $D_6$=3rd week of Nov. 1961, $D_7$=4th week of Nov. 1961, $D_8$=1st week of Dec. 1961, $D_9$=2nd week of Dec. 1961 and $D_{10}$=3rd week of Dec. 1961.

Treatments in perpendicular direction :

5 irrigational treatments : $I_0$=No irrigation, $I_1$=3 irrigations at an interval of 30 days, $I_2$=4 irrigations at an interval of 21 days, $I_3$=6 irrigations at an interval of 15 days and $I_4$=8 irrigations at an interval of 10 days.

3. DESIGN :

(i) Strip-plot. (ii) (a) 10 strips in one direction ; 5 strips in orthogonal direction. (b) N.A. (iii) 2. (iv) (a) 8·5 m.×7·3 m. (b) 7·3 m.×6·7 m. (v) 61 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas.* (iv) (a) 1958-N.A. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RETULTS :

(i) 385 Kg/ha. (ii) (I) 51·2 Kg/ha. (D) 168·7 Kg/ha. (ID) N.A. (iii) Main effects of I and D are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $D_1$ | $D_2$ | $D_3$ | $D_4$ | $D_5$ | $D_6$ | $D_7$ | $D_8$ | $D_9$ | $D_{10}$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $I_0$ | 497 | 471 | 526 | 656 | 347 | 289 | 254 | 127 | 147 | 78 | 339 |
| $I_1$ | 552 | 497 | 563 | 650 | 332 | 266 | 306 | 150 | 147 | 81 | 354 |
| $I_2$ | 480 | 497 | 702 | 800 | 358 | 375 | 341 | 127 | 136 | 75 | 389 |
| $I_3$ | 520 | 609 | 604 | 852 | 456 | 448 | 393 | 150 | 153 | 72 | 426 |
| $I_4$ | 656 | 673 | 685 | 823 | 335 | 367 | 332 | 110 | 136 | 66 | 418 |
| Mean | 541 | 549 | 616 | 756 | 366 | 349 | 325 | 133 | 144 | 74 | 385 |

C.D. for I marginal means=45·0 Kg/ha.

C.D. for D marginal means=170·9 Kg/ha.

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 63(122), 64(204).**

**Site :- Agri. Res. Stn., Bagalkot.** **Type :- 'D'.**

Object :—To determine a suitable method of controlling weeds in Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) Nil. (ii) Medium black cotton soil; black soil. (iii) 25.9.63; 2.9.64. (iv) (a) 2 ploughings and cross ploughing (1963); Ploughing and harrowing (1964). (b) Dibbled in furrows. (c) N.A. (1963); 7·4 Kg/ha. (1964). (d) N.A. (e) N.A.; 1. (v) 62·8 Q/ha. of F.Y.M. ; Nil. (vi) *Jayadhar*. (vii) Unirrigated. (viii) 3 intercultivations (1963); weeding and interculturing (1964). (ix) 33 cm.; 61 cm. (x) 29.3.64; N.A.

2. TREATMENTS :

5 weedicidal treatments : $W_0$=Unweeded (control), $W_1$=Local method of weeding, $W_2$=Pre-emergence application of weedicides, $W_3$=Pre-emergence application of weedicides+cultural method of weeding and $W_4$=Cultural method of weeding (twice with implements and once hand weeding).

Weedicides used : Fermoxon applied at 0·68 Kg. equivlent in 302·8 litres of water.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 8·5 m.×4·9 m. (v) 2 rows alround. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1963 to 66. (Expt. for 1965 N.A.) (b) No. (c) Nil. (v) Gadag and Dharwar. (vi) Nil. (vii) Error variances are heterogeneous. Treatments×years interaction is absent.

5. RESULTS :

63(122)

(i) 588 Kg/ha. (ii)141·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $W_0$ | $W_1$ | $W_2$ | $W_3$ | $W_4$ |
|---|---|---|---|---|---|
| Av. yield | 606 | 540 | 599 | 558 | 639 |

64(204)

(i) 338 Kg/ha. (ii) 68.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $W_0$ | $W_1$ | $W_2$ | $W_3$ | $W_4$ |
|---|---|---|---|---|---|
| Av. yield | 379 | 325 | 278 | 356 | 354 |

**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 65(2).**

**Site :- Soil Cons. Res. Farm, Bellary.** **Type :- 'D'.**

Object :—To study the effect of "Benedyne" a plant growth stimulant on physical conditions of the soil and nutrient release for plant of growth.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 5000 Kg/ha. of F.Y.M. (ii) Deep black cotton soil. (iii) 24.9.65. (iv) (a) Ploughing and light harrowing. (b) Dibbling by the dibbler 5 to 6 cm. below surface. (c) N.A. (d) 30 cm. ×30 cm. (e) 1. (v) 50 Kg/ha. of N+50 Kg/ha. of $P_2O_5$ (with harrow on 18.8.65). (vi) P.R.S.—72 (early). (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 67 cm. (x) 1.2.66.

2. TREATMENTS :

5 sprayings of Benedyne : $T_0$=Control (water sprayed), $T_1$=142 g ., $T_2$=284 gm., $T_3$=426 gm. nnd $T_4$=568 gm. of Benedyne in 22·7 litres of water/plot.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 15·2 m.×0·6 m. (iii) 5. (iv) (a) and (b) 3·1 m.×0·6 m. (v) Nil. (vi) Yes.

4. GENERAL ;

(i) Abnormal. (ii) Nil. (iii) *Kapas* yield. (iv) (a) and (b) No. (c) Nil. (v) N.A. (vi) Crop affected by drought. (vii) Nil.

5. RESULTS :

(i) 271 Kg/ha. (ii) 61·4 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. yield | 234 | 224 | 316 | 350 | 230 |

C.D.=82·4 Kg/ha.

**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 62(271).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'D'.**

Object :—To find out an effective insecticide for control of various Cotton pests.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M. (ii) Black soil. (iii) 11.8.62. (iv) (a) Ploughing and harrowing 2 to 3 times. (b) Hand dibbling. (c) 10 to 12 Kg/ha. (d) 61 cm.×31 cm. (e) 1. (v) Nil. (vi) *Laxmi* (vii) Unirrigated. (viii) Intercultivation by implements. (ix) 48 cm. (x) 5.4.63.

2. TREATMENTS:

6 sprayings of insecticides : $T_0$=Control without water, $T_1$=Control with water, $T_2$=Sevin at 0·02%, $T_3$= D.D.T. at 0·1%+B.H.C. at 0·1%, $T_4$=Endrine at 0·02% and $T_5$=Parathion at 0·03%.

Spraying of insecticides once in 10 days (8 sprays).

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 1/8 ha. (iii) 5. (iv) (a) and (b) 1/247 ha. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Aphids, Jassids, Thrips, Mite and Boll worm. Control measures as per treatments. (iii) Yield of *kapas*. (iv) (a) 1962—Contd. (Treatments modified every year). (b) No. (c) Nil. (v) Hagari and Gadag. (vi) Nil. (vii) N.A.

5. RESULTS :

(i) 425 Kg/ha. (ii) 53·7 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 345 | 247 | 577 | 437 | 479 | 464 |

C.D.=70·8 Kg/ha.

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 63(228).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'D'.**

Object :—To find out an effective insecticide for control of various Cotton pests.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) N.A. (ii) Black soil. (iii) 11.8.63. (iv) (a) Ploughing and harrowing 2 to 3 times. (b) Hand dibbling. (c) 10 to 12 Kg/ha. (d) 61 cm.×31 cm. (e) 1. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) Intercultivation by implements. (ix) 27 cm. (x) N.A.

2. TREATMENTS :

6 sprayings of insectides : $T_0$=Control (no insecticide), $T_1$=Carbaryl 0·2%, $T_2$=D.D.T. 0·1%+B.H.C. 0·1%, $T_3$=Endrine 0·02%, $T_4$=Parathion 0·03% and $T_5$=Control with water.

Insecticides sprayed once in 10 days.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) and (b) 1/247 ha, (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Aphids, Jassids, Thrips, Mites and Boll worm. Control measures as per treatments. (iii) Yield of *kapas*. (iv) (a) 1962—Contd. (Treatments modified every year). (b) No. (c) Nil. (v) Hagari. (vi) and (vii) N.A.

5. RESULTS :

(i) 408 Kg/ha. (ii) 64·2 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| T reatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 275 | 1102 | 263 | 214 | 298 | 296 |

C.D.=84·7 Kg/ha.

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**Crop :- Cotton.** **Ref :- Ref :- Ms. 64(197).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'D'.**

Object :—To find out an effective insecticide for controlling various Cotton pests.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) N.A. (ii) Black soil. (iii) N.A. (iv) (a) Ploughing and 2 to 3 harrowings. (b) Hand dibbling. (c) 10 to 12 Kg/ha. (d) 61 cm.×31 cm. (e) One. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) Interculturing by implements. (ix) 61 cm. (x) N.A.

2. TREATMENTS :

6 insecticides : $T_0$=Control, $T_1$=Carbaryl 0·2 %, $T_2$=Endrine 0·02%, $T_3$=Parathion 0·03% replaced by Endrine 0·02%, $T_4$=Theometon 0·05% replaced by Endrine 0·02% and $T_5$=D.D.T. 0·1% +B.H.C. 0·1%.

Spraying once in 10 days.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 1/197·7 ha. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Aphids, Jassids, Thrips, Mites etc. Control measures as per treatments. (iii) Yield of *kapas*. (iv) (a) 62—contd. (Treatments modified every year). (b) No. (c) Nil. (v) Hagari and Gadag. (vi) and (vii) N.A.

5. RESULTS :

(i) 973 Kg/ha. (ii) 167·7 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 666 | 1205 | 1034 | 1188 | 1007 | 736 |

C D.=226·0 Kg/ha.

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 62(272).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'D'.**

Object :—To find out an effective insecticide for control of various Cotton pests like Aphids, Jassids and Thrips.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M. (ii) Black soil. (iii) 11.8.62. (iv) (a) Ploughing and harrowing 2 to 3 times. (b) Hand dibbling. (c) 10 to 12 Kg/ha. (d) 61 cm. between rows and 31 cm. within plants. (e) One. (v) Nil. (vi) *Laxmi* Cotton. (vii) Unirrigated. (viii) Intercultivation by implements. (ix) 48 cm. (x) 5.4.63

2. TREATMENTS :

6 insecticides : $T_0$=Control without water, $T_1$=Control with water, $T_2$=Sevin 0·02%, $T_3$=D.D.T. 0·1%+B.H.C. 0·1%, $T_4$=Endrine 0·02% and $T_5$=Parathion 0·03%.
Spray once in 15 days (7 sprays).

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) ⅛ha. (iii) 5. (iv) (a) and (b) 1/247 ha. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Aphids, Jassids, Thrips, Mite—control measures as per treatments. (iii) *Kapas* yield. (iv) (a) 1962 only. (b) No. (c) Nil. (v) Hagari. (vi) and (vii) N.A.

5. RESULTS :

(i) 698 Kg/ha. (ii) 42·5 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 409 | 483 | 949 | 738 | 882 | 729 |

C.D.=56·1 Kg/ha.

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 63(229).**
**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'D'.**

Object :—To find out an effective insecticide for control of various Cotton pests.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar.* (c) N.A. (ii) Black soil. (iii) 11.8.63. (iv) (a) Ploughing and 2 to 3 harrowings. (b) Hand dibbling. (c) 10 to 12 Kg/ha. (d) 61 cm.×30 cm. (e) One. (v) Nil. (vi) *Laxmi.* (vii) Unirrigated. (viii) Intercultivation by implements. (ix) 27 cm. (x) N.A.

2. TREATMENTS :

6 insecticides : $T_0$=Control (no insecticide), $T_1$=Control with water, $T_2$=Carbaryl 0·2%, $T_3$=D.D.T. 0·1%+B.H.C. 0·1% and $T_4$=Parathion 0·03%.
Insecticides sprayed once in 15 days.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) and (b) 1/247 ha. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Aphids, Thrips, Jassids, Mites and Boll worm. (iii) *Kapas* yield. (iv) (a) 62. (b) No. (c) Nil. (v) Hagari. (vi) Nil. (vii) N.A.

5. RESULTS :

(i) 370 Kg/ha. (ii) 59·3 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 210 | 336 | 836 | 289 | 258 | 290 |

C.D.=78·2 Kg/ha.

**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 64(193).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'D'.**

Object :—To find out an effective insecticide that can control various Cotton pests.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) N.A. (ii) Black soil. (iii) 13, 14.8.1964. (iv) (a) Ploughing and 2 to 3 harrowings. (b) Hand dibbling. (c) 10 to 12 Kg/ha. (d) 61 cm.×30 cm. (e) One. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) Intercultivation by implements. (ix) 51 cm. (x) N.A.

2. TREATMENTS :

7 insecticides : $T_0$=Control, $T_1$=Control with water, $T_2$=Carbaryl 0·2%, $T_3$=Endrine 0·2%, $T_4$=D.D.T. 0·1% +B.H.C. 0·1 %, $T_5$=Parathion 0·03% and $T_6$=Thiometon 0·05%.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) and (b) 1/198 ha. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Aphids, Mites, Thrips, Boll worm and Jassids—Control measures as per treatments. (iv) (a) 62. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) N.A.

5. RESULTS :

(i) 710 Kg/ha. (ii) 110·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 704 | 634 | 801 | 768 | 668 | 631 | 766 |

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 62(273).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'D'.**

Object :— To find out an effective insecticide for control of various Cotton pests.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 12·4 Q/ha. of F.Y.M. (ii) Black soil. (iii) 11.8.62. (iv) (a) Ploughing and 2 to 3 times harrowing. (b) Hand dibbling. (c) 10 to 12 Kg/ha. (d) 61 cm. between rows and 30 cm. within plants. (e) One. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) Intercultivation by implements. (ix) 48 cm. (x) 5.4.63.

2. TREATMENTS :

6 insecticides : $T_0$=Control without water, $T_1$=Control with water, $T_2$=Sevin 0·02%, $T_3$=D.D.T. 0·1% +B.H.C. 0·1%, $T_4$=Endrine 0·02% and $T_5$=Parathion 0·03%.
Spraying once in 20 days (6 sprays).

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 1/8 ha. (iii) 5. (iv) 1/247 ha. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Aphids, Jassids, Thrips, Mites and bollworm. Control measures as per treatments. (iii) *Kapas* yield. (iv) (a) 1962—64. (Treatmonts modified every year). (b) No. (c) Nil. (v) Hagari. (vi) and (vii) N.A.

5. RESULTS :

(i) 548 Kg/ha. (ii) 49·2 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 366 | 370 | 774 | 597 | 651 | 532 |

C.D.=64·9 Kg/ha,

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**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 63(230).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'D'.**

Object :— To find out an effective insecticide for control of various Cotton pests.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) N.A. (ii) Black soil. (iii) 11.8.1963. (iv) (a) Ploughing and 2 to 3 times harrowings. (b) Hand dibbling. (c) 10 to 12 Kg/ha. (d) 61 cm.×30 cm. (e) One. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) Interculturing by implements. (ix) 27 cm. (x) N.A.

2. TREATMENTS:

6 insecticides : $T_0$=Control, $T_1$=Control with water, $T_2$=Carboryal 0·2%, $T_3$=D.D.T. 0 1%+B.H.C. 0·1%, $T_4$=Endrine 0·02% and $T_5$=Parathion 0·03%,

Spraying once in 20 days.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) and (b) 1/247 ha. (v) Nil. (vi) N.A.

4. GENERAL :

(i) Fair. (b) Aphids, Jassids, Thrip-Mites and Bollworm etc. Control measures as per treatments. (iii) Yield of *kapas*, (iv) (a) 1962—64 (treatments modified every year). (b) No.(c) Nil. (v) Hagari. (vi) Nil. (vii) N.A.

5. RESULTS :

(i) 389 Kg/ha. (ii) 96·4 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 271 | 315 | 846 | 311 | 313 | 275 |

C.D·=127·1 Kg/ha.

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**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 64(194).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'D'.**

Object :— To find out an effective insecticide that can control various Cotton pests.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) N.A. (ii) Black soil. (iii) 13, 14.8.1964. (iv) (a) Ploughing and harrowing 2 to 3 times. (b) Hand dibbling. (c) 10 to 12 Kg/ha. (d) 61 cm.×30 cm. (e) one. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) Interculturing by implements. (ix) 51 cm. (x) N.A.

2. TREATMENTS :

8 insecticides : $T_0$=Control, $T_1$=Control with water, $T_2$=Carbaryl 0·2%, $T_3$=Endrine=0·02%, $T_4$= D.D.T. 0·1%+B.H.C. 0·1%, $T_5$=Parathion 0·03%, $T_6$=Thiometion 0·05% and $T_7$=Carbaryl 10% dust (22·4 Kg/ha).

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) and (b) 1/197·7 ha. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Aphids, Jassids, Thrips, Mites and Bollworm. Control measures as per treatments. (iii) *Kapas* yield. (iv) (a) 1962—64 (Treatments midified every year). (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) N.A.

5. RESULTS :

(i) 850 Kg/ha. (ii) 181·3 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 645 | 748 | 1208 | 880 | 724 | 781 | 864 | 946 |

C.D.=234·6 Kg/ha.

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 62(68).**

**Site :- Agri. College Farm, Dharwar.** **Type :- 'D'.**

Object :— To study suitable method of weed control for Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*. (b) *Jowar*, (c) N.A. (ii) Medium black. (iii) 6.9.62. (iv) (a) 2 ploughings and 3 harrowings. (b) to (e) N.A, (v) Nil. (vi) *Jayadhar*. (vii) Unirrigated. (viii) As per treatments. (ix) 6 cm. (x) 17.3.63 to 7.4.63.

2. TREATMENTS :

5 weedicidal treatments : $W_0$=Unweeded control, $W_1$=Local type of weeding (by hand and implements), $W_2$=Pre-emergence application of weedicide, $W_3$=Pre-emergence application of weedicide+cultural method of weeding (once with implements and once hand weeding) and $W_4$=Cultural methods of weeding (twice with implements and once hand weeding).

Formance 2, 4-D applied at 1·7 Kg. equivalent/ha. at 900 litres/ha. of water for pre-emergence application.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 7·0 m.×5·5 m. (v) 2 rows on all sides. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) N.A. (b) No. (c) Nil. (v) Bagalkot, Gadag and Siruguppa. (vi) and (vii) Nil.

5. RESULTS :

(i) 484 Kg/ha. (ii) 52·0 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $W_0$ | $W_1$ | $W_2$ | $W_3$ | $W_4$ |
|---|---|---|---|---|---|
| Av. yield | 528 | 478 | 530 | 433 | 452 |

C.D.=69·9 Kg/ha.

**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 63(123).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'D'.**

Object :— To determine a suitable method of controlling weeds for Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 62·8 Q/ha. of F.Y.M. (ii) Deep black cotton soil. (iii) 23.8.63. (iv) (a) 2 ploughings and cross ploughing. (b) Dibbled in furrows. (c) to (e) N.A. (v) 62·8 Q/ha. of F.Y.M (vi) *Jayadhar*. (vii) Unirrigated. (viii) 2 times interculturing and levelling. (ix) 41 cm. (x) 1 to 30.3.1964.

2. TREATMENTS and 3. DESIGN :

Same as in Expt. no. 62(68) on page 446.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) N.A. (b) No. (c) Nil. (v) Bagalkot, Gadag and Siruguppa. (vi) Rainfall poor and ill distributed. (vii) Nil.

5. RESULTS :

(i) 367 Kg/ha. (ii) 82·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $W_0$ | $W_1$ | $W_2$ | $W_3$ | $W_4$ |
|---|---|---|---|---|---|
| Av. yield | 340 | 389 | 345 | 361 | 401 |

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**Crop :- Cotton.** **Ref :- Ms. 64(196).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'D'.**

Object :— To find out an effective insecticide for controlling various Cotton pests.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) N.A. (ii) Black soil. (iii) N.A. (iv) (a) Ploughing, harrowing 2 to 3 times. (b) Hand dibbling. (c) 10 to 12 Kg/ha. (d) 61 cm.×30 cm. (e) One. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) Interculturing by implements. (ix) 61 cm. (x) N.A.

2. TREATMENTS :

4 insecticides : $T_0$=Control, $T_1$=Carbaryl 0·2%, $T_2$=Endrine 0·02%, and $T_3$=D.D.T. 0·1%+B.H.C. 0·1%.

Spraying once in 15 days.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 1/197·7 ha. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Aphids, Thrip, Jassids, Mites, Bollworm etc. Control measures as per treatments. (iii) Yield of *kapas*. (iv) (a) 1962 only. (b) No. (c) Nil. (v) Hagari and Gadag. (vi) and (vii) N.A.

5. RESULTS :

(i) 920 Kg/ha. (ii) 211·0 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av. yield | 593 | 1423 | 1021 | 641 |

C.D.=290·8 Kg/ha.

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**Crop :- Cotton.** **Ref :- Ms. 64(192).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'D'.**

Object :— To find out an effective insecticide that can control various Cotton pests.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) N.A. (ii) Black soil. (iv) (a) Ploughing and 2 to 3 harrowings. (b) Hand dibbling. (c) 10 to 12 Kg/ha. (d) 61 cm.×30 cm. (e) One. (v) Nil (vi) *Laxmi*. (vii) Unirrigated. (viii) Intercultivation by implements. (ix) 51 cm. (x) N.A.

2. TREATMENTS :

7 insecticides : $T_0$=Control, $T_1$=Control with water, $T_2$=Carbaryl 0·2%, $T_3$=Endrine 0·02%, $T_4$=D.D.T. 0·1%+B.H.C. 0·1%, $T_5$=Parathion 0·03% and $T_6$=Thiometon 0·05%.

Spraying once in 10 days.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) and (b) 1/197 7 ha. (v) Nil. (vi) Yes.

4. GENERAL ;

(i) Fair. (ii) Aphids, jassids, Thrips, Mites and Bollworm. (iii) Yield of *kapas*. (iv) (a) 1962 only. (b) No. (c) Nil. (v) Hagari. (vi) and (vii) N.A.

5. RESULTS :

(i) 817 Kg/ha. (ii) 107·4 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 620 | 686 | 1120 | 887 | 759 | 857 | 794 |

C.D.=140·1 Kg/ha.

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 62(70), 63(121), 64(211) 65(115).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'D'.**

Object :— To determine a suitable method of controlling weeds for Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*. (b) *Jawar*. (c) N.A. (1962), Nil in 1963 ; 12·4 C.L./ha. of F.Y.M. (1964, 1965). (ii) Medium black. (iii) 15.9.1962 ; 25.9.1963 ; 23.9.1964 ; N.A. (iv) (a) 2 ploughings and 3 harrowings (1962) ; 2 ploughings and cross ploughing (1963) ; 2 wooden ploughings, 2 to 3 harrowings (1964, 1965). (b) Dibbling. (c) N.A. in 1962 and 1963 ; 11·2 Kg/ha. in 1964 and 1965. (d) N.A. in 1962 and 1963; 61 cm.× 31 cm. in 1964 and 1965. (e) N.A. in 1962 and 1963 ; 1 in 1964 and 1965. (v) Nil (1962, 1964 and 1965) ; 62·8 Q/ha. of F.Y.M. in 1963. (vi) *Laxmi*. (vii) Unirrigated. (viii) 3 weedings ; (As per treatments). (ix) 40 cm. ; 33 cm. ; N.A. ; N.A. (x) 24.8.1963 to 31.3.1963 ; 22.2.1964 to 17.3.1964 ; N.A. ; N.A.

2. TREATMENTS :

Same as in Expt. no. 62(68) conducted at Dharwar on page 446.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) N.A, (b) 7·9 m.×4·9 m. (v) 2 rows on all sides. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) 1962—N.A. (b) No. (c) As under 5. Results. (v) Dharwar and Siruguppa. (vi) Nil. (vii) Error variances are heterogeneous. Treatments × years interaction is absent.

5. RESULTS :

62(70)

(i) 217 Kg/ha. (ii) 76·5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $W_0$ | $W_1$ | $W_2$ | $W_3$ | $W_4$ |
|---|---|---|---|---|---|
| Av. yield | 215 | 234 | 164 | 198 | 276 |

63(121)

(i) 576 Kg/ha. (ii) 114·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $W_0$ | $W_1$ | $W_2$ | $W_3$ | $W_4$ |
|---|---|---|---|---|---|
| Av. yield | 595 | 649 | 494 | 555 | 570 |

64(211)

(i) 702 Kg/ha. (ii) 177·3 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $W_0$ | $W_1$ | $W_2$ | $W_3$ | $W_4$ |
|---|---|---|---|---|---|
| Av. yield | 487 | 861 | 540 | 762 | 860 |

C.D.=237·6 Kg/ha.

65(115)

(i) 696 Kg/ha. (ii) 127·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $W_0$ | $W_1$ | $W_2$ | $W_3$ | $W_4$ |
|---|---|---|---|---|---|
| Av. yield | 840 | 720 | 609 | 627 | 683 |

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**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 60(164).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'D'.**

Object :—To find out the effect of different insecticidal sprayings at different periods on Cotton yield.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) Nil. (ii) Medium black. (iii) 12.9.60. (iv) (a) 2 ploughings and 2 harrowings. (b) Dibbled in furrows. (c) to (e) N.A. (v) 50·2 Q/ha. of compost. (vi) *Laxmi*. (vii) Unirrigated. (viii) 3 weedings and 4 interculturings. (ix) 25 cm. (x) 27.3.61.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 insecticidal treatments : $I_0$=Control, $I_1$=Endrix, $I_2$=Geigy 1250 and $I_3$=Folidol.
(2) 3 intervals between spray : $T_1$=2, $T_2$=4 and $T_3$=6 weeks.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6·4 m.×4·3 m. (v) 2 rows alround. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) yield of *kapas*. (iv) (a) 1959 - N.A. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 459 Kg/ha. (ii) 84·7 Kg/ha. (iii) Main effect of I is highly significant. Main effect of T and interaction 'control vs. others' are signigcant. (iv) Av. yield of *kapas* in Kg/ha.

| | $I_0$ | $I_1$ | $I_2$ | $I_3$ | Mean |
|---|---|---|---|---|---|
| $T_1$ | — | 590 | 422 | 558 | 523 |
| $T_2$ | — | 481 | 318 | 537 | 445 |
| $T_3$ | — | 475 | 431 | 459 | 455 |
| Mean | 413 | 515 | 390 | 518 | 459 |

C.D. for I marginal means=70·5 Kg/ha.
C D. for 'control vs. others'=57·5 Kg/ha.

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**Crop :- Cotton.** **Ref :- Ms. 61(262).**

**Site :- Agri. Res. Stn., Hagari.** **Type :- 'D'.**

Object :—To find out an effective insecticide for control of various Cotton pests.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M. (ii) Black soil. (iii) 17.10.1961. (iv) (a) Ploughing and harrowing 2 to 3 times. (b) Hand dibbling. (c) 10 to 12 Kg/ha. (d) 61 cm. between rows and 30 cm. within plants. (e) One. (v) Nil. (vi) *Laxmi* Cotton. (vii) Irrigated. (viii) Intercultivation by implements. (ix) 28 cm. (x) N.A.

2. TREATMENTS :

7 insecticides : $T_0$=Control, $T_1$=0·25% sevin, $T_2$=0·04% Endrine, $T_3$=0·1% Malathion, $T_4$=0·1% D.D.T. +0·1% B.H.C., $T_5$=0·02% Parathion and $T_6$=0·04% Basudin.
6 sprays at 15 days interval.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/247 ha. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Aphids, jassids, thrips, mites and boll worm attack—control measures as per treatments. (iii) *kapas* yield. (iv) (a) 1961 only. (b) No. (c) Nil. (v) Dharwar and Gadag. (vi) Nil. (vii) N.A.

5. RESULTS :

(i) 552 Kg/ha. (ii) 52·4 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 479 | 831 | 575 | 485 | 479 | 477 | 537 |

C.D.=77·8 Kg/ha.

**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 62(268), 62(269), 62(270).**

**Site :- Agri. Res. Stn., Hagari.** **Type :- 'D'.**

Object :—To find out an effective insecticide for control of various Cotton pests.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M. (ii) Black soil. (iii) 3.9.62. (iv) (a) Ploughing and 2 to 3 times harrowings. (b) Hand dibbling. (c) 10 to 12 Kg/ha. (d) 61 cm. between rows and 30 cm. within plants. (e) One. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) Intercultivation by implements. (ix) 28 cm. (x) 11.2.63

2. TREATMENTS:

6 insecticides : $T_0$=Control without water, $T_1$=Control sprayed with water, $T_2$=Sevin 0·02%, $T_3$=D.D.T. 0·1%+B.H.C. 0·1%, $T_4$=Endrin 0·02% and $T_5$=Parathion 0·03%.

Separate experiments conducted with spray once in 10 days, 15 days and 20 days. 7 sprays, 7 sprays, 6 sprays were given respectively.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) 1/8 ha. (iii) 5. (iv) (a) and (b) 1/247ha. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair (ii) Aphids, jassids, thrips and mites attack; control measures as per treatments. (iii) *Kapas* yield. (iv) (a) and (b) No. (c) Nil. (v) Dharwar and Gadag. (vi) and (vii) N.A.

5. RESULTS :

**62(268)**

Spray once in 10 days.

(i) 280 Kg/ha. (ii) 71·9 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 104 | 92 | 713 | 443 | 242 | 55 |

C.D.=94·7 Kg/ha.

**62(269)**

Spray once in 15 days.

(i) 214 Kg/ha. (ii) 121·0 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 62 | 68 | 514 | 308 | 262 | 69 |

C.D.=159·7 Kg/ha.

**62(270).**

Spray once in 20 days.

(i) 225 Kg/ha. (ii) 48·1 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 84 | 82 | 527 | 326 | 268 | 65 |

C.D.=56·1 Kg/ha.

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**Cotton (*Rabi*).** **Ref :- Ms. 62(56), 63(59), 64(24).**

**Site :- Agri. Res. Stn., Siruguppa.** **Type :- 'D'.**

Object :—To determine a suitable method of controlling weeds for Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar* –Cotton. (b) *Jowar*. (c) 125·6 Q/ha. of F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ as basal dose. (ii) Black cotton soil. (iii) 31.8.1962 ; 2.9.1963 ; 30.8.1964. (iv) (a) Working victory plough, blade harrow and ridger in 1962 and 1963 ; ploughing in 1964. (b) Dibbling. (c) 15 to 20 Kg/ha. (d) 61 cm.× 23 cm. (e) 3 to 4 ; thinned to one only. (v) 125·6 Q/ha. of F.Y.M. as basal dressing+44·8 Kg/ha. of N as A/S after 40 days of sowing (All years) ; 322·4 Kg/ha. of $P_2O_5$ in 1964. (vi) *Laxmi* (medium). (vii) Irrigated. (viii) As per treatments. (ix) 34 cm ; 15 cm ; 24 cm. (x) 9.2.1963 to 6.4.1963 ; 29.2.1964 to 20.4.1964 ; 26.2.1965 to 19.3.1965.

2. TREATMENTS :

5 weedicidal treatments : $W_0$=Unweeded control, $W_1$=Local type of weeding (by hand and implements), $W_2$=Pre-emergence application of weedicide, $W_3$=Pre-emergence application of weedicide+cultural methods of weeding (once with implements and once hand weeding) and $W_4$=Cultural method of weeding (twice with implements and once hand weeding).

Faroxone 2,4–D applied at 1·7 Kg. equivalent/ha. at 900 litres. of water for pre-emergence application.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 1/198ha. (b) 1/247ha. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Heavy incidence of thrips, aphids, jassids and boll worm. Endrine sprayed 5 times at about 15 days. (iii) Yield of *Kapas*. (iv) (a) 1962 to 1964. (b) No. (c) As under 5. Results. (v) and (vi) N.A. (vii) Error are variances heterogeneous. Treatments×years interaction is present.

5. RESULTS :

(i) 572 Kg/ha. (ii) 347·2 Kg/ha. (based on 8 d.f. made up of Treatments×years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $W_0$ | $W_1$ | $W_2$ | $W_3$ | $W_4$ |
|---|---|---|---|---|---|
| Av. yield | 265 | 829 | 278 | 704 | 783 |

C.D.=292·4 Kg/ha.

| Years | $W_0$ | $W_1$ | $W_2$ | $W_3$ | $W_4$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|
| 1962 | 352 | 955 | 397 | 794 | 965 | ** | 693 | 105·6 |
| 1963 | 194 | 419 | 190 | 348 | 479 | ** | 326 | 81·2 |
| 1964 | 250 | 1113 | 246 | 969 | 905 | ** | 697 | 208·8 |
| Pooled | 265 | 829 | 278 | 704 | 783 | ** | 572 | 347·2 |

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**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 60(103).**

**Site :- Agri. Res. Stn., Siruguppa.** **Type :- 'D'.**

Object :—To find out a suitable insecticide that can control the different types of Cotton insects.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 125·6 Q/ha. of F.Y.M.+44·8 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super. (ii) (a) Black cotton. (iii) 20.8.60. (iv) (a) 2 ploughings. (b) Dibbling by hand. (c) 11 Kg/ha. (d) 38 cm.×30 cm. (e) N.A. (vi) 125·6 Q/ha. of F.Y.M.+44·8 Kg/ha. of N as Urea one month after sowing. (vi) *Laxmi* (late). (vii) Irrigated. (viii) Working cultivator once and 3 hand weedings. (ix) 31 cm. (x) 2.2.61 to 23.3.61.

2. TREATMENTS :

5 insecticidal treatments : $I_0$=Control, $I_1$=3 c.c. of Folidol/4·5 litres of water, $I_2$=10 c.c. of Endrine/4·5 litres of water, $I_3$=10 c.c. of Basudin/4·5 litres of water and $I_4$=454 gm. of Geigy 1250/72·7 of litres water.

The above insecticides were sprayed 5 times at an interval of 15 days.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 1/247. (v) Nii. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of aphids, thrips and jassids and to some extent boll worms. (iii) Yield of *kapas*. (iv) (a) 1960 only. (b) No. (c) Nil. (v) Hagari. (vi) Nil. (vii) Due to continuous rains after 12 days of sowing some seeds wasted away.

5. RESUTTS :

(i) 2065 Kg/ha. (ii) 324·9 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $I_0$ | $I_1$ | $I_2$ | $I_3$ | $I_4$ |
|---|---|---|---|---|---|
| Av. yield | 1590 | 2000 | 2064 | 2100 | 2073 |

C.D.=500·4 Kg/ha.

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**Crop :- Cotton.** **Ref :- Ms. 63(136).**

**Site :- Agri. Res. Stn., Siruguppa.** **Type :- 'D'.**

Object :—To find out a suitable method of controlling weeds in Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 621 Q/ha. of F.Y.M. (ii) Heavy black soil. (iii) 5.9.63. (iv) (a) 2 ploughings, cross ploughing and levelling. (b) Dibbling. (c) 11 Kg/ha. (d) 60 cm.×23 cm. (e) 2. (v) 628 Q/ha. of F.Y.M. (vi) *Laxmi*. (vii) Irrigated. (viii) As per treatments. (ix) 41 cm. (x) 20.2.64 to 25.3.64.

2. TREATMENTS :

Same as in expt. no. 62(68) conducted at Dharwar on page 446.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 9·3 m.×8·3 m. (b) 6·9 m.×5·9 m. (v) 120 cm.×120 cm. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Boll worm attack. (iii) Yield of *kapas*. (iv) (a) N.A. (b) No. (c) Nil. (v) Bagalkot, Dharwar and Gadag. (vi) and (vii) Nil.

5. RESULTS :

(i) 413 Kg/ha. (ii) 108·6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $W_0$ | $W_1$ | $W_2$ | $W_3$ | $W_4$ |
|---|---|---|---|---|---|
| Av. yield | 216 | 576 | 208 | 415 | 650 |

C.D.=145·7 Kg/ha.

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 62(67).**

**Site :- Agri. College Farm, Dharwar.** **Type :- 'DM'.**

Object :—To study the effect of different times of NAA spraying with different concentrations on *Jayadhar* Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*. (b) *Jowar*. (c) N.A. (ii) Medium black. (iii) 6.9.62, (iv) (a) 2 ploughings and 4 harrowings. (b) to (e) N.A. (v) Nil. (vi) *Jayadhar*. (vii) Unirrigated. (viii) 3 weedings and 3 interculturings. (ix) 6 cm. (x) 16.3.63 to 13.4.63.

2. TREATMENTS :

All combinations of (1), (2) and (3)+a control.

(1) 2 concentrations of harmones : $C_1=10$ and $C_2=20$ PPM of NAA.

(2) 3 times of spraying : $S_1$=At 4 to 5 leaf stage, $S_2$=At flowering stage and $S_3=\frac{1}{2}$ dose at 4 to 5 leaf stage+$\frac{1}{2}$ dose at flowering stage.

(3) 2 manurial treatments : $M_1$=22·4 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$ and $M_2$=44·8 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$.

Spraying done at 900 litres/ha. of water.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 5·5 m.×3·7 m. (v) 2 rows on all sides. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 737 Kg/ha. (ii) 47·0 Kg/ha. (iii) Main effect of M and 'coutrol *vs*. others' are highly significant. Interaction M×C×S is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=667 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $C_1$ | $C_2$ | Mean |
|---|---|---|---|---|---|---|
| $M_1$ | 719 | 745 | 713 | 724 | 727 | 726 |
| $M_2$ | 766 | 746 | 769 | 769 | 752 | 760 |
| Mean | 743 | 746 | 741 | 746 | 740 | 743 |
| $C_1$ | 747 | 752 | 741 | | | |
| $C_2$ | 738 | 740 | 741 | | | |

C.D. for comparison of control *vs*. others means=49·7 Kg/ha.

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 63(129).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'DM'.**

Object :—To study the effect of different times and concentrations of N.A.A. and B.N.A. spraying on the yield of Cotton crop.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 628 Q/ha. of F.Y.M. (ii) Deep black cotton soil. (iii) 18.8.63. (iv) (a) 2 ploughings, cross ploughing, 2 times harrowing and levelling. (b) Dibbled in furrows. (c) to (e) N.A. (v) 62·8 Q/ha. of F.Y.M. (vi) *Jayadhar*. (vii) Unirrigated. (viii) 3 interculturings and 3 weedings. (ix) 41 cm. (x) 17.2.64 to 20.3.64.

2. TREATMENTS :

All combinations of (1), (2) and (3)+2 control plots.

(1) 4 concentrations : $C_1$=10 PPM of NAA, $C_2$=20 PPM of NAA, $C_3$=10 PPM of BNA and $C_4$=20 PPM of BNA.

(2) 3 times of spraying : $T_1$=At 4 to 5 leaf stage, $T_2$=At flowering stage and $T_3$=½ dose at 4 to 5 leaf stage+½ dose at flowering stage.

(3) 2 manurial treatments : $M_1$=22·4 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$ and $M_2$= 44·8 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 26. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 9·8 m.×2·4 m. (v) 2 rows on all sides. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) N.A. (b) No. (c) Nil. (v) N.A. (vi) Poor and ill distributed rain. (vii) Nil.

5. RESULTS :

(i) 861 Kg/ha. (ii) 55·9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=860 Kg/ha.

| | $M_1$ | $M_2$ | $T_1$ | $T_2$ | $T_3$ | Mean |
|---|---|---|---|---|---|---|
| $C_1$ | 836 | 891 | 876 | 821 | 893 | 863 |
| $C_2$ | 850 | 888 | 872 | 855 | 879 | 869 |
| $C_3$ | 840 | 848 | 846 | 867 | 819 | 844 |
| $C_4$ | 868 | 872 | 840 | 901 | 869 | 870 |
| Mean | 848 | 875 | 858 | 861 | 865 | 861 |
| $T_1$ | 838 | 879 | | | | |
| $T_2$ | 852 | 870 | | | | |
| $T_3$ | 855 | 875 | | | | |

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**Crop :- Cotton** (*Rabi*). **Ref :- Ms. 62(76).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'DM'.**

Object : To find out the effect of foliar *vs.* soil application of fertilizers and the effect of harmones.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) Nil. (ii) Medium black cotton soil. (iii) 15.9.62. (iv) (a) 2 ploughings, 3 harrowings and opening furrows. (b) Dibbling. (c) to (e) N.A. (v) Nil. (vi) *Laxmi*. (vii) Unirrigated. (viii) 3 weedings. (ix) 40 cm. (x) 24.2.63 to 23.3.63.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1) and (2)+one control.

(1) 2 levels of N as Urea : $N_1=5{\cdot}6$ and $N_2=11{\cdot}2$ Kg/ha.

(2) 3 methods of application ; $M_1$=Soil application, $M_2$=Foliar application and $M_3=\frac{1}{2}$ dose as soil application+$\frac{1}{2}$ dose as foliar application.

**Sub-plot treatments :**

All combinations of (3) and (4)

(3) 2 levels of harmones : $H_1=10$ and $H_2=20$ PPM of NAA.

(4) 2 times of application : $T_1$=At 4 to 5 leaf stage and $T_2$=At flowering stage.

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 7·9 m.×4·9 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of *kapas*. (iv) (a) N.A. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 264 Kg/ha. (ii) (a) 75·2 Kg/ha. (b) 76·4 Kg/ha. (iii) N.A. (iv) Av. yield of *kapas* in Kg/ha.

Control

| | $H_1$ | $H_2$ | Mean |
|---|---|---|---|
| $T_1$ | 245 | 220 | 232 |
| $T_2$ | 192 | 196 | 194 |
| Mean | 218 | 208 | 213 |

| | $M_1$ | $M_2$ | $M_3$ | $H_1$ | $H_2$ | $T_1$ | $T_2$ | Mean |
|---|---|---|---|---|---|---|---|---|
| $N_1$ | 281 | 253 | 262 | 267 | 262 | 277 | 254 | 265 |
| $N_2$ | 311 | 248 | 286 | 264 | 299 | 298 | 267 | 282 |
| Mean | 296 | 250 | 274 | 266 | 281 | 287 | 260 | 273 |
| $T_1$ | 323 | 257 | 282 | 284 | 289 | | | |
| $T_2$ | 269 | 243 | 267 | 247 | 272 | | | |
| $H_1$ | 301 | 237 | 259 | | | | | |
| $H_2$ | 290 | 264 | 289 | | | | | |

C.D. for T marginal means=31·2 Kg/ha.

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**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 63(130).**

**Site :- Agri. Res. Stn., Siruguppa.** **Type :- 'DM'.**

Object : – To study the effect of different times of spraying NAA and BNA on Cotton crop.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 62·8 Q/ha. of F.Y.M. (ii) Black cotton soil. (iii) 3.9.63. (iv) (a) 2 ploughings, cross ploughing and levelling. (b) Dibbled in furrows. (c) to (e) N.A. (v) 62·8 Q/ha. of F.Y.M. (vi) *Laxmi*. (vii) Irrigated. (viii) 3 interculturings and weedings. (ix) 40 cm. (x) 9.3.64 to 3.4.64.

2. TREATMENTS :

All combinations of (1), (2) and (3)+2 control plots

(1) 4 concentrations : $C_1$=10 PPM of NAA, $C_2$=20 PPM of NAA, $C_3$=10 PPM of BNA and $C_4$=20 PPM of BNA.

(2) 3 times of sprayings : $T_1$=At 4 to 5 leaf stage, $T_2$=At flowering stage and $T_3$=½ dose at 4 to 5 leaf stage+½ dose at flowering stage.

(3) 2 manurial treatments: $M_1$=56 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+33·6 Kg/ha. of $K_2O$ and $M_2$= Twice of $M_1$.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 26. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 2·4 m.×8·3 m. (v) 2 rows on all sides. (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Heavy boll worm attack. (iii) Yield of *kapas*. (iv) (a) N.A. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 512 Kg/ha. (ii) 95·3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha.

Control=561 Kg/ha.

| | $M_1$ | $M_2$ | $T_1$ | $T_2$ | $T_3$ | Mean |
|---|---|---|---|---|---|---|
| $C_1$ | 495 | 482 | 491 | 441 | 533 | 488 |
| $C_2$ | 477 | 505 | 484 | 529 | 463 | 491 |
| $C_3$ | 505 | 525 | 543 | 465 | 537 | 515 |
| $C_4$ | 528 | 545 | 582 | 509 | 519 | 536 |
| Mean | 502 | 514 | 525 | 486 | 534 | 508 |
| $T_1$ | 516 | 533 | | | | |
| $T_2$ | 473 | 499 | | | | |
| $T_3$ | 516 | 510 | | | | |

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**Crop :- Cotton** (*Rabi*).

**Ref :- Ms. 63(44).**

**Site :- Agri. Res. Stn., Siruguppa.**

**Type :- 'DM'.**

Object :—To study the effect of different times and concentrations of NAA and BNA spraying on yield of Cotton crop.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) Wheat. (c) 124 Q/ha. of F.Y.M.+44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (ii) Black cotton soil. (iii) 5.9.63. (iv) (a) Working victory plough, hire kunte and sunna kunte. (b) Dibbling by hand. (c) 15 Kg/ha. (d) 61 cm.×30 cm. (e) 2 to 3. (v) As per treatments. (vi) *Laxmi* (late). (vii) Irrigated. (viii) 4 hand weedings, working with cultivator and ridger once. (ix) 15 cm. (x) 20.2.64 and 25.3.64.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1) and (2)+a control plot

(1) 4 concentrations : $C_1$=10 PPM of NAA, $C_2$=20 PPM of NAA, $C_3$=10 PPM of BNA and $C_4$=20 PPM of BNA.

(2) 3 times of spraying : $T_1$=At 4 to 5 leaf stage, $T_2$=At flowering stage and $T_3$=$\frac{1}{2}$ dose at 4 to 5 leaf stage and $\frac{1}{2}$ dose at flowering stage.

**Sub-plot treatments :**

2 manurial doses : $M_1$=56 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+33·6 Kg/ha. of $K_2O$ and $M_2$=Twice $M_1$.

3. DESIGN :

(i) Split-plot. (ii) (a) 13 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/247 ha. (b) 1/494 ha. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Heavy incidence of aphids, thrips. jassids and boll worms. No insecticidal spray was given as per instruction of cotton specialist. (iii) Population count, percentage of boll worm infestation etc. are recorded in addition to yield data. (iv) (a) 1963—65 (Design modified in 64). (b) No. (c) Nil. (v) and (vi) N.A. (vii) Nil.

5. RELULTS :

(i) 430 Kg/ha. (ii) (a) 55·8 Kg/ha. (b) 46·3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of *kapas* in Kg/ha,

Control=466 Kg/ha.

| | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $T_1$ | 419 | 423 | 453 | 519 | 452 | 454 | 453 |
| $T_2$ | 383 | 391 | 379 | 425 | 382 | 406 | 394 |
| $T_3$ | 435 | 423 | 430 | 451 | 433 | 437 | 435 |
| Mean | 412 | 412 | 421 | 465 | 422 | 432 | 427 |
| $M_1$ | 417 | 401 | 415 | 455 | | | |
| $M_2$ | 408 | 423 | 424 | 474 | | | |

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**Crop :- Cotton** (*Rabi*).

**Site :- Agri. Res. Stn., Siruguppa.**

**Ref :- Ms. 64(28).**

**Type :- 'DM'.**

Object :—To find out the effect of Naphthalenic acid spraying on Cotton.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Cotton. (b) *Jowar*. (c) 125·6 Q/ha. of F.Y.M.+44·8 Kg/ha. of N as A/S+22·4 Kg/ha. of $P_2O_5$ as Super. (ii) Black cotton soil. (iii) 30.8.64. (iv) (a) Working victory plough and harrowing. (b) Hand dibbling. (c) 6 Kg/ha. (d) 69 cm.×23 cm. (e) N.A. (v) Nil. (vi) Medium. (vii) Irrigated. (viii) 1 hand weeding. (ix) 24 cm. (x) 15.2.65 to 15.3.65.

2. TREATMENTS :

**Main-plot treatments :**

2 manurial treatments : $M_1$=56·0 Kg/ha. of N+33·6 Kg/ha. of P+33·6 Kg/ha. of K and $M_2$=121·1 Kg/ha. of N+67·2 Kg/ha. of P+67·2 Kg/ha. of K.

**Sub-plot treatments :**

All combinations of (1) and (2)+one control

(1) 4 concentrations : $C_1$=10 PPM of NAA alpha, $C_2$=20 PPM of NAA alpha, $C_3$=10 PPM of NAA beta and $C_4$=20 PPM of NAA beta.

(3) 3 times of application : $T_1$=At 4 to 5 leaf stage, $T_2$=At flowering stage and $T_3=\frac{1}{2}$ dose at 4 to 5 leaf stage+$\frac{1}{2}$ dose at flowering stage.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication; 13 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/247 ha. (b) 1/494 ha. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Aphids, jassids and boll worm. No control measures taken. (iii) Boll weight, yield of *kapas* and No. of seed/boll. (iv) (a) 1963–65. (b) No. (c) Nil. (v) (a) Dharwar, Gadag and Bagalkot. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1393 Kg/ha. (ii) (a) 698·8 Kg/ha. (b) 145·2 Kg/ha. (iii) Interaction M×T is highly significant and interaction M×C is significant. (iv) Av. yield of *kapas* in Kg/ha.

| | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $T_1$ | $T_2$ | $T_3$ | Mean |
|---|---|---|---|---|---|---|---|---|
| $M_1$ | 1228 | 1216 | 1171 | 1295 | 1274 | 1222 | 1187 | 1228 |
| $M_2$ | 1547 | 1537 | 1626 | 1574 | 1554 | 1619 | 1540 | 1571 |
| Mean | 1388 | 1376 | 1399 | 1435 | 1414 | 1420 | 1364 | 1399 |
| $T_1$ | 1333 | 1355 | 1470 | 1497 | | | | |
| $T_2$ | 1468 | 1442 | 1373 | 1399 | | | | |
| $T_3$ | 1362 | 1332 | 1353 | 1408 | | | | |

C.D. for C means at the same level of M=118·4 Kg/ha.
C.D. for M means at the same level of C=461·6 Kg/ha.
C.D. for T means at the same level of M=102·4 Kg/ha
C.D. for M means at the same level of T=459·2 Kg/ha.

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**Crop :- Tobacco.** **Ref :- Ms. 62(118),64(78).**

**Site :- Agri. Res. Stn., Nipani.** **Type :- 'M'.**

Object :—To study the effect of different placement methods of N, P and K fertilizers on the yield of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Tobacco. (b) Tobacco. (c) Nil. (ii) Medium black. (iii) N.A. (iv) (a) to (c) N.A. (d) 1·0m.×1·0m. (e) N.A. (v) 12·35 C.L./ha. of F.Y.M. (vi) S—20. (vii) Unirrigated. (viii) Interculturing and stirring. (ix) N.A. ; 6·5 cm. (x) N.A. ; 12.2.1965.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1), (2) and (3)

(1) 3 levels of N : $N_0=0$, $N_1=148{\cdot}3$ and $N_2=222.4$ Kg/ha.

(2) 2 levels of $P_2O_5$ : $P_0=0$ and $P_1=247{\cdot}1$ Kg/ha.

(3) 2 levels of $K_2O$ : $K_0=0$ and $K_1=148{\cdot}3$ Kg/ha.

**Sub-plot treatments :**

2 methods of placement : $M_1$=Drilling and $M_2$=Top dressing by hand around the plot.

3. DESIGN :

(i) Split-plot. (ii) (a) 12 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 12 m.× 12 m. (b) 40 Sq. m. in 1962 ; 10 m.×4 m. in 1964. (v) One row on both sides. (vi)Yes.

4. GENERAL :

(i) Normal. (ii) Nil in 1962 ; Aphid infestation controlled by the use of pesticides. (iii) Yield of tobacco. (iv) (a) 1962—N.A. (Expt. for 63—N.A.) (b) No. (c) Nil. (v) and (vi) N.A. (vii) Error variances of sub-plot treatments are heterogeneous. Individual results given.

5. RESULTS :

**62(118)**

(i) 1083 Kg/ha. (ii) (a) 197·2 Kg/ha. (b) 124·4 Kg/ha. (iii) Main effect of N is highly significant and interactions N×P and N×K are significant. (iv) Av. yield of tobacco in Kg/ha.

| | $P_0$ | $P_1$ | $K_0$ | $K_1$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 849 | 1035 | 963 | 922 | 944 | 941 | 942 |
| $N_1$ | 1170 | 1052 | 1177 | 1046 | 1069 | 1153 | 1111 |
| $N_2$ | 1169 | 1221 | 1114 | 1275 | 1211 | 1178 | 1195 |
| Mean | 1063 | 1103 | 1084 | 1081 | 1075 | 1091 | 1083 |
| $M_1$ | 1054 | 1095 | 1055 | 1095 | | | |
| $M_2$ | 1071 | 1111 | 1114 | 1067 | | | |
| $K_0$ | 1092 | 1077 | | | | | |
| $K_1$ | 1033 | 1129 | | | | | |

C.D. for N marginal means =100·4 Kg/ha.

C.D. for body of N×P or N×K table=142·0 Kg/ha.

**64(78)**

(i) 664 Kg/ha. (ii)(a) 129·2 Kg/ha. (b) 77·0 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of tobacco in Kg/ha.

| | $P_0$ | $P_1$ | $K_0$ | $K_1$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 514 | 572 | 559 | 527 | 518 | 568 | 543 |
| $N_1$ | 709 | 707 | 737 | 679 | 718 | 698 | 708 |
| $N_2$ | 713 | 770 | 758 | 725 | 766 | 717 | 741 |
| Mean | 645 | 683 | 684 | 644 | 667 | 661 | 664 |
| $M_1$ | 648 | 686 | 681 | 654 | | | |
| $M_2$ | 642 | 680 | 688 | 634 | | | |
| $K_0$ | 667 | 700 | | | | | |
| $K_1$ | 622 | 666 | | | | | |

C.D. for N marginal means=65·8 Kg/ha.

**Crop :- Tobacco (*Rabi*).** **Ref :- Ms. 61(90).**

**Site :- Agri. Res. Stn., Nipani.** **Type :- 'M'.**

Object :—To study the effect of organic vs. inorganic fertilisers on Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco after tobacco. (b) Tobacco. (c) N A. (ii) Medium black. (iii) 9.8.61. (iv) (a) Ploughing with iron plough and harrowing with wooden harrow. (b) Transplanting. (c)—. (d) 107 cm.×107 cm. (e) 1. (v) 12·4 C.L./ha. of F Y.M. (vi) S—20. (vii) Unirrigated. (viii) 8to 10 days interculturing followed by hand weeding and suckering. (ix) 92 cm. (x) 1.2.62.

2. TREATMENTS :

7 sources of N at 44·8 Kg/ha. : So=Control (No N), $S_1$=A/S, $S_2$=Urea, $S_3$=C/A/N, $S_4$=A/S/N, $S_5=\frac{1}{2}$ as A/S+$\frac{1}{2}$ as Cake and $S_6=\frac{1}{2}$ as F.M.+$\frac{1}{2}$ as A/S.

Fish manure (F.M.) applied a week before planting and A/S 3 weeks after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 14·9 m.×6·4 m. (b) 12·8 m.×4·3 m. (v) 107 cm.× 107 cm. (vi) Yes.

4. GENERAL. :

(i) Poor. (ii) Low infection of Aphids. No control measures taken. (iii) Yield of tobacco.(iv) (a) 1960—N.A. (b) Yes. (c) Nill. (v) and (vi) Nil. (vii) Heavy rains during Aug. & Sept. affected the yield to a considerable extent.

5. RESULTS :

(i) 408 Kg/ha. (ii) 59·2 Kg/ha. (iii) The treatment differences are highly significant. (iv) Av. yield of tobacco in Kg/ha.

| Treatment | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 318 | 412 | 476 | 423 | 373 | 437 | 417 |

C.D.=69·6 Kg/ha.

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**Crop :- Tobacco (*Rabi*).** **Res :- Ms. 63(93).**

**Site :- Agri. Res. Stn., Nipani.** **Type :- 'M'.**

Object :—To study the effect of organic vs. inorganic fertilizer on the yield and quality of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—tobabco. (b) Tobacco. (c) N.A. (ii) Medium deep. (iii) 10·8.1963. (iv) (a) Ploughing and harrowing. (b) Transplanting. (c) —. (d) 107 cm.×107 cm. (e) 1. (v) 62·8 Q/ha. of F.Y.M. (vi) S—20. (vii) Unirrigated. (viii) Hoeing. (ix) 40 cm. (x) N.A.

2. TREATMENTS :

7 manurial treatments : $T_0$=Control (no manure), $T_1$=A/S, $T_2$=Urea, $T_3$=C/A/N, $T_4$=A/S/N, $T_5$=66 Kg/ha. of N+11·2 Kg/ha. of $P_2O_5$ and $T_6$=66 Kg/ha. of N.

Quantity of N applied for $T_1$ to $T_4$ N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 6 m.×14 m. (b) 4 m.×12 m. (v) 1 m.×1 m. (vi) Yes.

4 GENERAL :

(i) Gappy. (ii) Slight attack of Aphids. No control measure taken. (iii) Yield of tobacco. (iv) (a) 1963 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 784 Kg/ha. (ii) 210·0 Kg/ha. (iii) The treatment differences are not significant. (iv) Av. yield of tobacco in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 630 | 840 | 875 | 905 | 756 | 780 | 706. |

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**Crop :- Tobacco.** (*Rabi*). **Ref :- Ms. 62(95), 64(80), 65(113).**

**Site :- Agri. Res. Stn., Nipani.** **Type :- 'M'.**

Object :—To study the effect of different type of inorganic fertilizers on *Bidi* tobacco.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Tobacco. (c) N.A. (ii) Medium black (1962) ; Medium deep (1964) and black soil (1965). (iii) Sept. 1962 ; 6.8.1964 ; 18.8.1965. (iv) (a) Ploughing and harrowing. (b) Transplanting. (c) —. (d) 107 cm.×107 cm. (e) 1. (v) 12·4 C.L./ha. of F.Y.M. (vi) S—20. (vii) Unirrigated. (viii) 12 hoeings and 12 interculsurings (1962) ; interculturing and stirring (1964) and weeding and topping etc. (1965). (ix) N.A. ; 65 cm ; 77 cm. (x) N.A. ; 25.1.1965 ; 22.1.1966.

2. TREATMENTS :

7 sources of N at 67·2 Kg/ha. : $S_0$=Control (No N), $S_1$=A/S, $S_2$=Urea, $S_3$=C/A/N, $S_4$=A/S/N, $S_5$=½ as A/S+½ as G.N.C. and $S_6$=½ as A/S+½ as Fish manure.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 14·9 m.×6·4 m. (b) 12·8 m.×4·3 m. (v) 107 cm.×107 m. (vi) Yes.

4. GENERAL :

(i) Fair ; Normal ; Normal. (ii) Nil (1962) ; Aphid infestation was controlled by the use of pesticides (1964 and 1965). (iii) Yield of tobacco. (iv) (a) 1962-68. (treatments modified in 1963). (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

62(95)

(i) 811 Kg/ha. (ii) 97·3 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of tobacco in Kg/ha.

| Treatment | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 537 | 876 | 923 | 919 | 858 | 751 | 816 |

C.D.=83·0 Kg/ha.

**64(80)**

(i) 47 Kg/ha. (ii) 11·0 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of *tobacco* in Kg/ha.

| Treatment | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 37 | 53 | 52 | 56 | 49 | 43 | 40 |

C.D.=9·4 Kg/ha.

65(113)

(i) 610 Kg/ha. (ii) 126 3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *tobacco* in Kg/ha.

| Treatment | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 635 | 605 | 506 | 717 | 649 | 572 | 586 |

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**Crop :- Tobacco. (*Kharif*).** **Ref :- Ms. 60(116).**

**Site :- Agri. Res. Stn., Nipani.** **Type :- 'M'.**

Object :—To find the most suitable time of application of F.Y.M., N and $K_2O$ for *Bidi* Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco after tobacco. (b) Tobacco. (c) N.A. (ii) Medium deep fairly well drained. (iii) N.A. (iv) (a) Ploughing and harrowing. (b) Transplanting. (c) —. (d) 107 cm. × 107 cm. (e) 1. (v) Green manuring, (vi) S—20. (vii) Unirrigated. (viii) 8 hoeings and 12 interculturings. (ix) 74 cm. (x) N.A.

2. TREATMENTS :

**Main-plot treatments :**

2 levels of F.Y.M. : $F_1$=12·4 and $F_2$=24·7 C.L./ha.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 3 sources of N at 44·8 Kg/ha. : $S_1$=Cake, $S_2$=A/S and $S_3$=½ as Cake+½ as A/S,

(2) 2 levels of $K_2O$ : $K_0$=0 and $K_1$=67·2 Kg/ha.

**Sub-sub-plot treatments :**

2 times of applications of fertilizers : $T_1$=At 3 weeks after planting and $T_2$=½ at 3 weeks after planting+½ at 8 weeks after planting.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 6 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 11·7 m. × 2·1 m. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of tobacco. (iv) (a) 1958-60. (b) Yes. (c) Nil. (v) N.A. (vi) Drought conditions just after sowing seeds and more rains in October and November. (vii) Nil.

5. RESULTS :

(i) 609 Kg/ha. (ii) (a) 206·0 Kg/ha. (b) 91·0 Kg/ha. (c) 238·0 Kg/ha. (iii) None of the effects is significant (iv) Av. yield of tobacco in Kg/ha.

| | $F_1$ | $F_2$ | $T_1$ | $T_2$ | $S_1$ | $S_2$ | $S_3$ | Mean |
|---|---|---|---|---|---|---|---|---|
| $K_0$ | 595 | 627 | 623 | 599 | 590 | 615 | 627 | 611 |
| $K_1$ | 555 | 659 | 614 | 600 | 557 | 614 | 650 | 607 |
| Mean | 575 | 643 | 618 | 600 | 574 | 614 | 639 | 609 |
| $S_1$ | 507 | 641 | 600 | 548 | | | | |
| $S_2$ | 597 | 632 | 616 | 613 | | | | |
| $S_3$ | 622 | 655 | 640 | 638 | | | | |
| $T_1$ | 587 | 650 | | | | | | |
| $T_2$ | 564 | 636 | | | | | | |

**Crop :- Tobacco.** **Ref :- Ms. 62(116).**

**Site :- Agri. Res. Stn , Nipani.** **Type :- 'M'.**

Object :—To study the effect of green manuring with fertilizers dose on the yield of *Bidi* Tobacco.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Tobacco. (c) Nil. (ii) Medium deep. (iii) N.A. (iv) (a) to (c) N.A. (d) 2 m.×2 m. (e) N.A. (v) Nil. (vi) S—20. (vii) Unirrigated. (viii) Interculturing and stirring. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 G.M. Crops : $M_0$=Control (No. G.M.), $M_1$=*Udid* and $M_2$=*Sanne hemp*.

(2) 2 levels of N : $N_0$=0 and $N_1$=98·8 Kg/ha.

(3) 2 levels of $P_2O_5$ : $P_0$=0 and $P_1$=247·1 Kg/ha.

4. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) 8 m.×8 m. (b) 6 m.×6 m. (v) 1 m.×1 m. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of tobacco. (iv) (a) 1962 only. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 2114 Kg/ha. (ii) 269·9 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of tobacco in Kg/ha.

| | $M_0$ | $M_1$ | $M_2$ | $P_0$ | $P_1$ | Mean |
|---|---|---|---|---|---|---|
| $N_0$ | 1839 | 1842 | 1946 | 1877 | 1875 | 1876 |
| $N_1$ | 2274 | 2262 | 2524 | 2305 | 2401 | 2353 |
| Mean | 2056 | 2052 | 2235 | 2091 | 2138 | 2114 |
| $P_0$ | 2023 | 1934 | 2316 | | | |
| $P_1$ | 2090 | 2170 | 2154 | | | |

C.D. for N marginal means=186·5 Kg/ha.

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**Crop :- Tobacco.** (*Rabi*). **Ref :- Ms. 63(95).**

**Site :- Agri. Res. Stn., Nipani.** **Type :- 'M'.**

Object :—To find the most suitable green manure for this tract with fertilizers dose.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Tobacco. (b) Tobacco. (c) N.A. (ii) Medium deep. (iii) 10.8.1963. (iv) (a) Ploughing and harrowing. (b) Transplanting. (c)—. (d) 107 cm.×107 cm. (e) one. (v) 62·8 Q/ha. of F.Y.M. (vi) S--20. (vii) Unirrigated. (viii) 12 ploughings and 12 interculturings. (ix) 40 cm. (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)
(1) 3 G.M. crops : $M_0$=Control, $M_1$=*Udid* and $M_2$=*Sannhemp*.
(2) 2 levels of N : $N_0$=0 and $N_1$=148·3 Kg/ha. [½ as A/S and ½ as G.N.C.].
(3) 2 levels of $P_2O_5$ as Super : $P_0$=0 and $P_1$=247·1 Kg/ha.

In case of G.M. crops ½ the dose will be drilled at sowing the crops and the remaining ½ at establishment.

The above 12 treatment combinations were applied in 3 sets of plots. All the plots receive G.M. in the first year and in the subsequent years alternate plots will receive G.M.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 36. (b) N.A. (iii) 4. (iv) (a) 8 m.×8 m. (b) 6 m.×6 m. (v) 1 m.×1 m. (vi) Yes.

4. GENERAL :

(i) Fairly good. (ii) Slight Aphid infection. No control measures taken. (iii) Yield of tobacco. (iv) (a) 1963 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 680 Kg/ha. (ii) 142·5 Kg/ha. (iii) None of the effects is significant. (v) Av. yield of tobacco in Kg/ha.

| | $N_0$ | $N_1$ | $P_0$ | $P_1$ | Mean |
|---|---|---|---|---|---|
| $M_0$ | 704 | 713 | 707 | 709 | 708 |
| $M_1$ | 593 | 710 | 665 | 638 | 652 |
| $M_2$ | 642 | 718 | 733 | 627 | 680 |
| Mean | 646 | 714 | 702 | 658 | 680 |
| $P_0$ | 686 | 717 | | | |
| $P_1$ | 607 | 710 | | | |

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**Crop :- Tobacco (*Kharif*).** **Ref :- Ms. 60(117).**

**Site :- Agri. Res. Stn., Nipani.** **Type :- 'M'.**

Object :—To find the suitable placement of fertilisers for *Bidi* Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Tobacco. (b) Tobacco. (c) 12·4 C.L./ha. of F.Y.M.+fertilisers as per treatments. (ii) Medium deep fairly well drained. (iii) N.A. (iv) (a) Ploughing and harrowing. (b) Transplanting. (c) —. (d) 107 cm.×107 cm. (e) 1. (v) 12·4 C.L./ha. of F.Y.M. (vi) S-20. (vii) Unirrigated. (viii) 8 hoeings and 12 interculturings. (ix) 74 cm. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 2 manurial treatments : $M_1$=44·8 Kg/ha. of N (½ as Cake+½ as Sulphate) and $M_2$=$M_1$+112·1 Kg/ha. of $P_2O_5$+67·2 Kg/ha. of $K_2O$.
(2) 3 methods of placement : $F_1$=Usual method, $F_2$=Deep placement (15 cm. deep and 23 cm. away from plants) and $F_3$=¼ by usual method+3/4 by deep placement.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 18·1 m.×4·3 m. (b) 16 m.×2·1 m. (v) 107 cm.×107 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of tobacco. (iv) (a) 1957 to 60. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 516 Kg/ha. (ii) 281·2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of tobacco in Kg/ha.

| | $F_1$ | $F_2$ | $F_3$ | Mean |
|---|---|---|---|---|
| $M_1$ | 430 | 585 | 510 | 508 |
| $M_2$ | 468 | 563 | 541 | 524 |
| Mean | 449 | 574 | 526 | 516 |

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**Crop :- Tobacco (*Rabi*).** **Ref :- Ms. 62(96).**

**Site :- Agri. Res. Stn., Nipani.** **Type :- 'M'.**

Object :—To study the effect of rare elements on the yield of Bidi Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) Medium black. (iii) October, 1972. (iv) (a) Ploughing and harrowing. (b) Transplanting. (c) —. (d) 107 cm. × 107 cm. (e) 1. (v) 12·4 C.L./ha. of F.Y.M.+67·2 Kg/ha. of N. (vi) S—320. (vii) Unirrigated. (viii) 8 hoeings and 12 interculturings. (ix) and (x) N.A.

2. TREATMENTS :

8 micronutrients : $M_0$=Control, $M_1$=50 Kg/ha. of C/S, $M_2$=50 Kg/ha. of Manganese, $M_3$=30 Kg/ha. of Manganesium, $M_4$=8 Kg/ha. of Borax, $M_5$=8 Kg/ha. of Ammonium Molybdate, $M_6$= 15 Kg/ha. of Ferrous Sulphate and $M_7$=8 Kg/ha. of Cobalt Nitrate.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 7 m. × 3 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of tobacco. (iv) (a) 1962—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 839 Kg/ha. (ii) 129·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of tobacco in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ | $M_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 818 | 693 | 870 | 808 | 944 | 868 | 837 | 877 |

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**Crop :- Tobacco (*Rabi*).** **Ref :- Ms. 63(97).**

**Site :- Agri. Res. Stn., Nipani.** **Type :- 'M'.**

Object :—To find the optimum combination of N, P and K for Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco – Tobacco. (b) Tobacco. (c) N.A. (ii) Medium deep. (iii) 12.9.1963. (iv) (a) Ploughing and harrowing. (b) Transplanting. (c) —. (d) 107 cm.×107 cm. (e) 1. (v) 62·8 Q/ha. of F.Y.M. (vi) S—20. (vii) Unirrigated. (viii) 12 interculturings and 12 hoeings. (ix) 40 cm. (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 levels of N as A/S : $N_1$=60 and $N_2$=90 Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_0$=0, $P_1$=30 and $P_2$=60 Kg/ha.
(3) 3 levels of $K_2O$ as Pot. Sul. : $K_0$=0, $K_1$=60 and $K_2$=100 Kg/ha.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 18. (b) 9·1 m.×8·2 m. (iii) 3. (iv) (a) and (b) 2·7 m.×1·5 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Slight attack of Aphids. No control measures taken. (iii) Yield of tobacco. (iv) (a) 1963—only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 177 Kg/ha. (ii) 31·9 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of tobacco in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 184 | 152 | 169 | 155 | 186 | 165 | 168 |
| $N_2$ | 175 | 193 | 192 | 183 | 191 | 186 | 186 |
| Mean | 180 | 172 | 180 | 169 | 188 | 175 | 177 |
| $K_0$ | 173 | 160 | 173 | | | | |
| $K_1$ | 182 | 187 | 196 | | | | |
| $K_2$ | 184 | 170 | 172 | | | | |

C.D. for N marginal means=17·6 Kg/ha.

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**Crop :- Tobacco (*Kharif*).** **Ref :- Ms. 60(115).**

**Site :- Agri. Res. Stn., Nipani.** **Type :- 'M'.**

Object : – To find the best green manure and optimum fertilizer dose for *Bidi* Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Tobacco. (b) and (c) As per treatments. (ii) Medium deep fairly well drained. (iii) N.A. (iv) (a) Ploughing and harrowing. (b) Transplanting. (c) —. (d) 107 cm.×107 cm. (e) N.A. (v) 12·4 C.L./ha. of F.Y.M. (vi) S—20. (vii) Unirrigated. (viii) 8 hoeings, 12 interculturings, weekly suckering, topping at central bud at 12 leaves and removal of lower leaves upto 15 cm. (ix) 74 cm. (x) N.A.

2. TREATMENTS :

**Main-plot treatments :**

4 G.M. crops : $G_0$=Control, $G_1$=*Udid*, $G_2$=*Charali* and $G_3$=*Sannhemp*.

**Sub-plot treatments :**

2 manurial treatments : $M_0$=Control, $M_1$=44·8 Kg/ha. of N (½ as Cake+½ as A/S).

**Sub-sub-plot treatments :**

4 periods for applying G.M. crops : $S_1$=1st season (1958-59), $S_2$=2nd season (1959-60), $S_3$=3rd season (1960-61) and $S_4$=4th season (1961-62).

### 3 DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication; 2 sub-plots/main-plot and 4 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) 14·9 m.×6·4 m. (b) 12·8 m.×4·3 m. (v) 107 cm.×107 cm. (vi) Yes.

### 4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of Tobacco. (iv) (a) 1958-60. (b) Yes. (c) Nil. (v) to (vii) Nil.

### 5. RESULTS :

(i) 606 Kg/ha. (ii) (a) 238·4 Kg/ha. (b) 130·7 Kg/ha. (c) 130·8 Kg/ha. (iii) Main effects of G, M, S and interaction G×S are significant. (iv) Av. yield of tobacco in Kg/ha.

| | $G_0$ | $G_1$ | $G_2$ | $G_3$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $M_0$ | 439 | 678 | 492 | 496 | 594 | 564 | 501 | 445 | 526 |
| $M_1$ | 630 | 888 | 568 | 661 | 696 | 754 | 670 | 627 | 687 |
| Mean | 534 | 783 | 530 | 578 | 645 | 659 | 585 | 636 | 606 |
| $S_1$ | 451 | 922 | 623 | 583 | | | | | |
| $S_2$ | 598 | 892 | 540 | 608 | | | | | |
| $S_3$ | 526 | 683 | 543 | 589 | | | | | |
| $S_4$ | 563 | 635 | 413 | 584 | | | | | |

C.D. for G marginal means =268·2 Kg/ha.
C.D. for M marginal means =90·8 Kg/ha.
C.D. for S marginal means =75·7 Kg/ha.
C.D. for S means at the same level of G=151·5 Kg/ha.
C.D. for G means at the same level of S=293·2 Kg/ha.

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**Crop :- Tobacco (*Rabi*).** **Ref :- Ms. 62(98), 63(98).**

**Site :- Agri. Res. Stn., Nipani.** **Type :- 'M'.**

Object :—To study the comparative merits of recommended dose with higher dose of fertilizer for *Bidi* Tobacco.

### 1. BASAL CONDITIONS :

(i) (a) Nil; Tobacco—Tobacco. (b) Tobacco. (c) N.A. (ii) Medium black; Medium deep. (iii) Sept. 1962; 12.9.63. (iv) (a) Ploughing and harrowing. (b) Transplanting. (c) —. (d) 107 cm.×107 cm. (e) 1. (v) 12·4 C.L./ha. of F.Y.M. (1962); 62·8 Q/ha. of F.Y.M. (1963). (vi) S—20. (vii) Unirrigated. (viii) 12 hoeings and 12 interculturings. (ix) N.A.; 40 cm. (x) N.A.

### 2. TREATMENTS :

4 manurial treatments : $M_0$=Control, $M_1$=44·8 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$, $M_2$ =67·2 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$+22·4 Kg/ha. of $K_2O$ and $M_3$=$M_2$ applied in 2 doses.

### 3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 11. (iv) (a) and (b) 20 m.×4 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of tobacco. (iv) (a) 1962 to 63. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous. Treatments × years interaction is present.

5. RESULTS :

(i) 546 Kg/ha. (ii) 202·0 Kg/ha. (based on 3 d.f. made up of treatments × years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of tobacco in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ |
|---|---|---|---|---|
| Av. yield | 468 | 594 | 542 | 578 |

| Years | $M_0$ | $M_1$ | $M_2$ | $M_3$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|
| 1962 | 219 | 254 | 292 | 289 | * | 264 | 57·0 |
| 1963 | 717 | 934 | 791 | 868 | N.S. | 828 | 112·2 |
| Pooled | 468 | 594 | 542 | 578 | N.S. | 546 | 202·0 |

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**Crop :- Tobacco (*Kharif*).** **Ref :- Ms. 63,64 (S.F.T.).**

**Site :- (District) : Mysore.** **Type :- 'M'.**

Object:—Type $A_1$ : To study the response curves of important cereals, cash and oil seed crops to Nitrogen applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red sandy. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :
O =Control (no manure)
$N_1$ =15 Kg/ha. of N.
$N_2$ =30 Kg/ha. of N.
$P_1$ =30 Kg/ha. of $P_2O_5$.
$N_1P_1$ =15 Kg/ha. of N+30 Kg/ha of $P_2O_5$.
$N_2P_1$ =30 Kg/ha. of N+30 Kg/ha. of $P_2O_5$.
$N_2P_2$ =30 Kg/ha. of N+60 Kg/ha. of $P_2O_5$.
$N_2P_2K_1$=30 Kg/ha. of N+60 Kg/ha. of $P_2O_5$+30 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN:

(i) A selected district is divided into four agriculturally homogeneous zones based on climate, soil, cropping pattern etc. In each zone one block is selected at random. A block normally consists of a group of 50—100 villages. In each block 36 experiments are conducted in a year of which 11 are of type $A_1$, 11 of type $A_2$, 11 of type $A_3$ and 3 are of type C. The eleven experiments under type $A_1$, $A_2$ and $A_3$ are distributed as 3 on a *kharif* cereal, 3 on a *rabi* cereal, 3 on a cash crop and 2 on oil seeds. All the three type C experiments are conducted on a legume crop. For the purpose of conducting the $A_1$, $A_2$ and $A_3$ experiments, 11 villages are randomly selected in each block and in each village 3 experiments one each of type $A_1$,$A_2$ and $A_2$ are laid out. For conducting the three type C trials three villages are randomly selected in each block. (iii) and (iv) N.A.

4. GENERAL:

(i) to (iii) N.A. (iv) (a) 1963 ot 1964 (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

63(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of tobacco in Kg/ha. | 2029 | 2138 | 1245 | 1564 | 2326 | 2006 | 3340 | 515·8 |

Control yield=4207 Kg/ha. ; No. of trials=6.

64 (S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of tobacco in Kg/ha. | 289 | 1963 | 1910 | 4177 | 4111 | 4889 | 6378 | 929·3 |

Control yield=15965 Kg/ha. ; No. of trials=3.

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**Crop :- Tobacco (*Kharif*).**

**Site :- (District) : Mysore.**

**Ref :- Ms. 63, 64 (S.F.T.).**

**Type :- 'M'.**

Object :—Type $A_2$ : To study the response curves of important cereal, cash and oilseed crops to Phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red sandy. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :

O =Control (no manure).
$N_1$ =15 Kg/ha. of N.
$P_1$ =30 Kg/ha. of $P_2O_5$.
$P_2$ =60 Kg/ha. of $P_2O_5$.
$N_1P_1$ =15 Kg/ha. of N+30 Kg/ha. of $P_2O_5$.
$N_1P_2$ =15 Kg/ha. of N+60 Kg/ha. of $P_2O_5$.
$N_2P_2$ =30 Kg/ha. of N+60 Kg/ha. of $P_2O_5$.
$N_2P_2K_2$ =30 Kg/ha. of N+60 Kg/ha. of $P_2O_5$+60 Kg/ha.of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in Type $A_1$ on page 469.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1963 to 1964. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

63 (S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of tobacco in Kg/ha. | 2401 | 1146 | 1920 | 2217 | 2095 | 2576 | 3321 | 518·0 |

Control yield=3120 Kg/ha. ; No. of trials=6.

64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of tobacco in Kg/ha. | 3479 | 1739 | 1673 | 1133 | 4546 | 5811 | 7894 | 1182·6 |

Control yield=15893 Kg/ha. ; No. of trials=3.

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**Crop :- Tobacco (*Kharif*).** **Ref :- Ms. 63,64(S.F.T.).**
**Site :- (District) : Mysore** **Type :- 'M'.**

Object :—Type $A_3$ : To study the response curves of important cereal, cash and oilseed crops to Potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red sandy (iii) to (vi) N.A. (vii) Unirrigated (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :
O =Control (no manure).
$N_1$ =15 Kg/ha. of N.
$K_1$ =30 Kg/ha. of $K_2O$.
$K_2$ =60 Kg/ha. of $K_2O$.
$N_1K_1$ =15 Kg/ha. of N+30 Kg/ha. of $K_2O$.
$N_1K_2$ =15 Kg/ha. of N+60 Kg/ha. of $K_2O$.
$N_2K_2$ =30 Kg/ha. of N+60 Kg/ha. of $K_2O$.
$N_1P_1K_1$=15 Kg/ha. of N+30 Kg/ha. of $P_2O_5$+30 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in type $A_1$ on page 469.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1963 to 1964 (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

63 (S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of tobacco in Kg/ha. | 1792 | 876 | 487 | 1429 | 1360 | 1344 | 1136 | 431·4 |

Control yield=3096 Kg/ha. ; No. of trials=6.

64 (S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of tobacco in Kg/ha. | −428 | 2082 | −975 | 3222 | 5245 | 4467 | 7775 | 1329·3 |

Control yield=15728 Kg/ha. ; No. of trials=3.

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**Crop :- Tobacco (*Rabi*).** **Res :- Ms. 61(89), 62(117), 63(94).**

**Site :- Agri. Res. Stn., Nipani.** **Type :- 'C'.**

Object :—To study the effect of interculturing and hand stirring on *Bidi* Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil ; N.A., Tobacco—Tobacco (1963). (b) Tobacco. (c) 12·4 C.L./ha. of F.Y.M., N.A. (ii) Medium black (1961, 1962) ; Medium deep (1963). (iii) 24.8.1961 ; N.A. ; 10.8.1963. (iv) (a) Ploughing with iron plough and harrowing with wooden harrow (1961) ; N.A. (1962) ; ploughing and harrowing (1963) (b) Transplanting. (c) —. (d) 107 cm. × 107 cm (e) 1. (v) 12·4 C.L./ha. of F.Y.M.+44 8 Kg/ha. of N (½ G.N.C.+½ A/S) (1961) ; N.A. ; (1962) ; 62:8 Q/ha. of F.Y.M. (1963). (vi) S—20. (vii) Unirrigated. (viii) As per treatments. (ix) 91 cm. ; N.A. ; 40 cm. (x) 13.2.1962 ; N.A. for 1962 and 1963.

2. TREATMENTS :

**Main-plot treatments.**

3 levels of interculturing : $I_1=10$, $I_2=15$ and $I_3=20$ interculturings.

**Sub-plot treatments.**

3 Stirring treatments : $S_0=N_0$ Stirring, $S_1$=Stirring after every interculturing and $S_2$=Stirring after alternate interculturing.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 10·7 m × 8·5 m. (b) 8·5 m. × 6.4 m. (v) 107 cm. × 107 cm. (vi) Yes.

4. GENERAL :

(i) Normal (1961) ; Fair ; (1962) Fairly good (1963). (ii) Aphid infection was observed. insecticides were sprayed (1961) ; Nill (1962), Slight attack of aphids. No control measures taken (1963). (iii) Yield of tobacco. (iv) (a) 1961—1963. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Both the error variances homogeneous. Main plots treatments × years and sub-plot treatments × years interactions are absent.

5. RESULTS :

(i) 702 Kg/ha. (ii) (a) 107·1 Kg/ha. (based on 34 d.f. made up of pooled error and years × main-plot treatments interaction). (b) 97·1 Kg/ha. (based on 102 d.f. made up of pooled error + years+sub plot × years × main × sub-plot treatments interaction. (iii) None of the effects is significant. (iv) Av. yield of tobacco in Kg/ha.

| | $I_1$ | $I_2$ | $I_3$ | Mean |
|---|---|---|---|---|
| $S_0$ | 699 | 696 | 708 | 701 |
| $S_1$ | 705 | 668 | 737 | 703 |
| $S_2$ | 681 | 724 | 703 | 703 |
| Mean | 695 | 696 | 716 | 702 |

| Years | $I_1$ | $I_2$ | $I_3$ | Sig. | S.E./plot | $S_0$ | $S_1$ | $S_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1961 | 323 | 336 | 317 | N.S. | 77·2 | 308 | 337 | 330 | N.S. | 325 | 83·8 |
| 1962 | 944 | 971 | 997 | N.S. | 80·2 | 953 | 958 | 1001 | N.S. | 971 | 92·0 |
| 1963 | 818 | 780 | 835 | N.S. | 149·8 | 842 | 815 | 776 | N.S. | 811 | 105·2 |
| Pooled | 695 | 696 | 716 | N.S. | 107·1 | 701 | 703 | 703 | N.S. | 702 | 97·1 |

**Crop :- Tobacco (*Rabi*).** **Ref :- Ms. 62(97), 63(96).**

**Site :- Agri. Res. Stn., Nipani.** **Type :- 'C'.**

Object :—To study the effect of different depths of tillage on *Bidi* Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) Medium black; medium deep. (iii) Sept 1962 ; 6.8.1963. (iv) (a) As per treatments. (b) Transplanting. (c) —. (d) 107 cm.×107 cm. (e) 1. (v) 12·35 C.L./ha. of F.Y.M. +124·6 Kg/ha. of N ; 62·8 Q/ha. of F.Y.M. (vi) S--20. (vii) Unirrigated. (viii) 8 to 12 hoeings and 12 interculturings. (ix) N.A.: 40 cm. (x) N.A.

2. TREATMENTS :

8 ploughing treatments : $T_0$=Control (no ploughing), $T_1$=wooden plough every year, $T_2$=Medium plough every year, $T_3$=Medium plough alternate year, $T_4$=Medium plough once in 3 years, $T_5$=Deep ploughing every year, $T_6$=Deep ploughing alternate year and $T_7$=Deep ploughing once in 3 years.

Depth of ploughing with wooden, medium and deep ploughing will be 8 to 10 cm., 10 to 15 cm. and 15 to 20 cm. respectively.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) 12 m.×12.m. (b) 10 m.×10 m. (v) 1 m.×1 m. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of tobacco. (iv) (a) 1962 to 1967 (treatments modified in 1964). (b) No. (c) As under 5 Results. (v) and (vi) Nil. (vii) Error variances are homogeneous. Treatments×years interaction is absent.

5. RESULTS :

(i) 752 Kg/ha. (ii) 70·4 Kg/ha. (based on 49 d.f. composed of pooled error and treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of tobacco in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 696 | 770 | 726 | 808 | 786 | 744 | 719 | 750 |

| Years | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | 777 | 793 | 829 | 829 | 842 | 800 | 758 | 802 | N.S. | 808 | 65·1 |
| 1963 | 615 | 747 | 623 | 787 | 729 | 688 | 680 | 697 | * | 696 | 73·1 |
| Pooled | 696 | 770 | 726 | 808 | 786 | 744 | 719 | 750 | N.S. | 752 | 70·4 |

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**Crop :- Tobacco (*Rabi*).** **Ref :- Ms. 64(79), 65(112).**

**Site :- Agri. Res. Stn., Nipani.** **Type :- 'C'.**

Object :—To study the effect of depth due to implements used, on growth yield and quality of *Bidi* Tobacco.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Tobacco. (c) N.A. (1964) ; 12·4 C.L./ha. of F.Y.M. (1965). (ii) Medium deep ; black soil. (iii) 19.8.1964 ; 19.8.1965. (iv) (a) N.A. (1964) ; harrowing and ploughing (1965). (b) Planting by hand. (c) N.A. (d) 1 m.×1 m. (e) 1. (v) 12·4 C.L./ha. of F.Y.M. (vi) S-20. (vii) Unirrigated. (viii) Interculturing and stirring (1964) ; weeding, lopping and desuckring etc. (1965). (ix) 65 cm. ; 77 cm. (x) 2.2.1965 ; 28.1.1966.

2. TREATMENTS :

8 ploughing treatments : $T_0$=Single harrowing every year, $T_1$=Wooden ploughing (8 to 10 cm.) every year, $T_2$=Deep ploughing (10 to 15 cm.) every year, $T_3$=Deep ploughing (10 to 15 cm.) alternate year, $T_4$=Deep ploughing (10 to 20 cm.) once in 3 years, $T_5$=Deep ploughing (15 to 20 cm.) by K-9 every year, $T_6$=Deep ploughing (15 to 20 cm.) alternate year and $T_7$=Deep ploughing (15 to 20 cm.) once in 3 years.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 12 m.×12 m. (b) 10 m.×10 m. (v) 1 m.×1 m. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Applied infestation controlled by the use of pesticides. (iii) Yield of tobacco. (iv) (a) 1962 to 1967 (modified in 1964). (b) Yes since 1964. (c) Nil. (v) N A. (vi) and (vii) Nil.

5. RESULTS :

64(79)

(i) 790 Kg/ha. (ii) 21·1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cured leaf in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 714 | 899 | 788 | 713 | 863 | 850 | 682 | 811 |

65(112)

(i) 1069 Kg/h. (ii) 148·9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cured leaf in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 1040 | 1016 | 1131 | 1034 | 947 | 1160 | 1058 | 1164 |

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**Crop :- Tobacco.** **Ref :- Ms. 62(144), 63(146).**

**Site :- Tobacco Res. Stn., Hansur.** **Type :- 'D'.**

Object :—To control Cut worm damage in country Tobacco fields.

1. BASAL CONDITIONS :

(i) (a) to (c) Nil. (ii) Red loam to sandy loam; Red loam. (iii) 28.8.62; 21.8.63. (iv) (a) Ploughing. (b) Transplanting. (c) —. (d) and (e) N.A. (v) Nil. (vi) Country tobacco. (vii) Unirrigated. (viii) Weeding, gap filling. (ix) 7 cm.; 10 cm. (x) 6.9.62; 21 to 25.9.63.

2. TREATMENTS :

7 chemical treatments : $T_0$=Control, $T_1$=Endrine 20 E.C. 0·03%, $T_2$=Aldrine 20 E.C. 0·04%, $T_3$=Chlordane 70 E.C. 0·05%, $T_4$=Diazimon 20 E.C. 0·03%, $T_5$=Heptachlor 20 E.C. 0·03% and $T_6$=D.D.T. 50% W.P.O. 15%.

$T_1$, $T_2$, $T_4$ and $T_5$ chemicals dissolved 16 c.c. in 10 litres of water while $T_3$ as 8 c.c. in 10 litres of water and $T_6$ as 31 gm in 10 litres of water.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 28·3 sq. m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) As per treatments. (iii) Percentage of cut worm damaged seedlings. (iv) (a) 1962 to 63. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Error variances are heterogeneous. Treatments×years interaction is absent.

5. RESULTS :

**62(144)**

(i) 6·10%. (ii) 1·48%. (iii) Treatment differences are significant. (iv) Av. percent of cut worm damaged seedlings/plot.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|---|
| Av. percent | 11·9 | 5·8 | 4·0 | 4·4 | 6·5 | 5·4 | 4·8 |

C.D.=2·2 percent.

**63(146)**

(i) 4·9%. (ii) 2·4%. (iii) Treatment differences are significant. (iv) Av. percent incidence of cut worm/plot.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|---|
| Av. percent | 8·5 | 3·3 | 4·3 | 2·4 | 7·2 | 6·2 | 2·4 |

C.D.=3·6 percent.

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**Crop :- Tobacco.** **Ref :- Ms. 61(169), 62(147), 63(149), 64(108).**

**Site :- Tobacco Res. Stn., Hunsur. Type :- 'D'.**

Object :—To control leaf spots in fields by priming leaves and spraying Dithane Z—78.

1. BASAL CONDITIONS

(i) (a) to (c) Nil. (ii) Red loam to sandy loam. (iii) 1.8.61: 3.8.62; 30.7.63; 19.8.64. (iv) (a) Ploughing and harrowing. (b) Transplanting in 61, 63 and 64; broadcasting in 62. (c) 4 Kg/ha. (d) 84 cm.×84 cm. (e) N.A. (v) 109 Q/ha. of Muncipal Compost+80 Kg/ha. of N+50 Kg/ha. of $P_2O_5$+25 Kg/ha. of $K_2O$. (vi) Virginia Gold. (vii) Unirrigated. (viii) Weedings and loosening the soil. (ix) 11 cm.; 25 cm.; 10 cm.; 20 cm. (x) 15.10.61; 17.10.62; 4.10.63; 21, 23.10.64.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 primings : $P_0$=No priming, $P_1$=Priming at 21 days after planting, $P_2$=Priming at 35 days after planting and $P_3$=Priming at 21 and 35 days after planting.

(2) 2 sprayings : $S_0$=No spraying and $S_1$=Spraying of Dithene Z—78.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 39·4 Sq. m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) As per treatments. (iii) Frog eye spot count/leaf position. (iv) (a) 1961 to 64. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous. Treatments×years interaction is present.

5. RESULTS :

(i) 21·6 frog eye spots/leaf. (ii) 12·8 frog eye spots/leaf (based on 21 d.f. made up of Treatments×years interaction). (iii) None of the effects is significant. (iv) Mean no. of frog eye spots/leaf position.

|  | $P_0$ | $P_1$ | $P_2$ | $P_3$ | Mean |
|---|---|---|---|---|---|
| $_0$ | 20·1 | 20·8 | 23·7 | 16·6 | 20·3 |
| $S_1$ | 22·3 | 22·1 | 25·0 | 22·2 | 22·9 |
| Mean | 21·2 | 21·4 | 24·4 | 19·4 | 21·6 |

| Years | $P_0$ | $P_1$ | $P_2$ | $P_3$ | Sig. | $S_0$ | $S_1$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1961 | 10·2 | 5·3 | 5·0 | 4·8 | * | 5·7 | 7·0 | N.S. | 6·3 | 2·8 |
| 1962 | 24·8 | 31·2 | 43·2 | 38·3 | * | 32·9 | 35·9 | N.S. | 34·4 | 12·2 |
| 1963 | 44·4 | 42·7 | 41·7 | 29·9 | N.S. | 35·2 | 44·2 | N.S. | 39·7 | 19·1 |
| 1964 | 5.2 | 6·5 | 7·5 | 4·8 | N.S. | 7·5 | 4·5 | * | 6·0 | 3·7 |
| Pooled | 21·2 | 21·4 | 24·4 | 19·4 | N.S. | 20·3 | 22·9 | N.S. | 21·6 | 12·8 |

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**Crop :- Tobacco (*Rabi*).** **Ref :- Ms. 61(94), 62(115).**

**Site :- Agri. Res. Stn., Nipani.** **Type :- 'D'.**

Object :—To study the feasibility of sucker control in *Bidi* Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Tobacco. (b) Tobacco. (c) 12·4 C.L./ha. of F.Y.M. (ii) Medium black; Medium deep. (iii) 23.8.61; N.A. (iv) (a) Ploughing with iron plough (1961) ; N.A. (1962). (b) Transplanting (1961) ; N.A. (1962). (c)—. (d) 107 cm. × 107 cm. (1961); N.A. (1962). (e) 1. (61); N.A. (62). (v) 12·4 C.L./ha. of F.Y.M. (vi) S—20. (vii) Unirrigated. (viii) Interculturing followed by hand weeding (61) ; Nil (62). (ix) 91 cm. ; N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 5 methods of application : $A_0$=No application (used hand suckering), $A_1$=Application of coconut oil after topping the tip and at each leaf axil, $A_2$=Alpha NAA applied to cut ends after topping, $A_3$=Melaic hydroxide to the top 6 leaves at the time of topping as spray and $A_4$=Melaic hydroxide (in water) applied as in $A_3$.

(2) 2 types of sucker : $S_1$=Top sucker and $S_2$=Bottom sucker.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 8·5 m. × 4·3 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal (1961) ; Good (62). (ii) Aphid infection. No control measures in 61; Nil in 62. (iii) Sucker weight. (iv) (a) 1961—62. (b) No. (c) As under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous. Treatments × years interaction is present.

5. RESULTS :

(i) 382 Kg/ha. (ii) 552·5 Kg/ha. (based on 9 d.f. made up of treatments × years interaction). (iii) None of the effects is significant. (iv) Av. yield of suckers in Kg/ha.

| | $A_0$ | $A_1$ | $A_2$ | $A_3$ | $A_4$ | Mean |
|---|---|---|---|---|---|---|
| $S_1$ | 203 | 462 | 496 | 714 | 808 | 537 |
| $S_2$ | 166 | 398 | 113 | 276 | 190 | 229 |
| Mean | 184 | 430 | 304 | 495 | 499 | 382 |

| Years | $A_0$ | $A_1$ | $A_2$ | $A_3$ | $A_4$ | Sig. | $S_1$ | $S_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1961 | 82 | 177 | 142 | 210 | 214 | ** | 207 | 124 | ** | 165 | 34·7 |
| 1962 | 287 | 684 | 467 | 779 | 784 | ** | 867 | 334 | ** | 600 | 191·3 |
| Pooled | 184 | 430 | 304 | 495 | 499 | N.S. | 537 | 229 | ** | 382 | 552·5 |

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**Crop :- Groundnut (*Kharif*).** **Ref :- Ms. 60(81), 61(43).**

**Site :- Agri. Res. Stn., Bailhongal.** **Type :- 'M'.**

Object :—To find out the optimum combination of N, P and K for Groundnut crop.

1. BASAL CONDITIONS :

(i) (a) Gram—Groundnut. (b) Gram. (c) Nil. (ii) Light masari. (iii) 26.6.60; 16.6.61. (iv) (a) Harrowing. (b) Drilling. (c) 90 Kg/ha. (d) 30 cm. between rows and 10 to 15 cm. between plants. (e) N.A. (v) 12·4 C.L./ha. of F.Y.M. (vi) Spanish improved (early). (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 79 cm. ; 38 cm. (x) 23, 24.10.60; 23.9.61.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=11·2$ and $N_2=22·4$ Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_0=0$, $P_1=112·1$ and $P_2=224·3$ Kg/ha.
(3) 3 levels of $K_2O$ as Pot. Sul. : $K_0=0$, $K_1=112·1$ and $K_2=224·3$ Kg/ha.

Manures applied in one dose by fertilizer-cum-seed drill at drilling.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 3 blocks/replications, 9 plots/block. (b) N.A. (iii) 2. (iv) (a) 11·0 m.×6·4 m. (b) 9·1 m.×4·6 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Tikka disease, no control measure taken. (iv) (a) 1956—61. (b) No. (c) As under 5. Results. (v) Bijapur, Annigiri and Dharwar in 1960 and Bijapur, Dharwar in 1961. (vi) Nil. (vii) Experiments with numbers 56(141), 56(127), 58(94) and 59(39) were also taken into consideration for pooling. Error variances are homogeneous and treatments×years interaction is present.

5. RESULTS :

(i) 711 Kg/ha. (ii) 148·0 Kg/ha. (based on 90 d.f. made up of treatments×years interaction). (iii) None of effects is significant. (iv) Av. yield of pods in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 660 | 694 | 729 | 645 | 722 | 716 | 694 |
| $N_1$ | 700 | 709 | 692 | 685 | 708 | 708 | 700 |
| $N_2$ | 690 | 755 | 770 | 730 | 734 | 752 | 738 |
| Mean | 683 | 719 | 730 | 687 | 721 | 725 | 711 |
| $K_0$ | 643 | 712 | 706 | | | | |
| $K_1$ | 707 | 709 | 748 | | | | |
| $K_2$ | 701 | 738 | 736 | | | | |

| Years | $N_0$ | $N_1$ | $N_2$ | Sig. | $P_0$ | $P_1$ | $P_2$ | Sig. | $K_0$ | $K_1$ | $K_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 309 | 317 | 336 | N.S. | 295 | 338 | 330 | N.S. | 306 | 335 | 322 | N.S. | 321 | 118·3 |
| 1961 | 889 | 851 | 897 | N.S. | 884 | 914 | 840 | N.S. | 878 | 934 | 825 | * | 879 | 120·8 |
| Pooled | 694 | 700 | 738 | N.S. | 683 | 719 | 730 | N.S. | 687 | 721 | 725 | N.S. | 711 | 148·0 |

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**Crop :- Groundnut.** *(Kharif)*. **Ref :- Ms. 64(17).**

**Site :- Reg. Sorghum Res. Stn., Bailhongal.** **Type :- 'M'.**

Object :—To study the comparative effects of new fertilizers, Ammo. Phos. and Nitrophos. with A/S and Urea.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Groundnut—Wheat. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M. (ii) Light Masari. (iii) 2.7.1964. (iv) (a) One ploughing and 3 harrowing. (b) Dibbling. (c) 37 Kg/ha. (d) 46 cm.×30 cm. (e) Nil. (v) 12·4 C.L./ha. of F.Y.M. (vi) Erect type. (vii) Nil. (viii) 2 intercultivation and weeding (ix) 81 cm. (x) 20.10.64.

2. TREATMENTS :

All combinations of (1) and (2)+3 extra treatments

(1) 3 levels of manures : $M_1$=10 Kg/ha. of N+30 Kg/ha. of $P_2O_5$, $M_2$=20 Kg/ha. of N+30 Kg/ha. of $P_2O_5$ and $M_3$=20 Kg/ha. of N+60 Kg/ha. of $P_2O_5$.

(2) 4 sources : $S_1$=Ammo. phos.+Super, $S_2$=Nitrophos.+Super, $S_3$=A/S+Super and $S_4$=Urea+Super.

3 extra treatments : $P_0$=0, $P_1$=30 and $P_2$=60 Kg/ha. of $P_2O_5$.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 11·0 m.×6·4 m. (b) 9·1 m.×4·6 m. (v) 91 cm. ×91 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Height of plants, No. of pods/plants and weight of pods. (iv) (a) and (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 998 Kg/ha. (ii) 111·6 Kg/ha. (iii) S effect is significant. Extra vs. others effect is significant. (iv) Av. yield of pods in Kg/ha.

$P_0=794$, $P_1=893$ and $P_2=1002$ Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $M_1$ | 1033 | 825 | 1125 | 1046 | 1007 |
| $M_2$ | 1128 | 945 | 1158 | 1052 | 1071 |
| $M_3$ | 945 | 1025 | 1084 | 926 | 995 |
| Mean | 1035 | 932 | 1122 | 1008 | 1024 |

C.D. for S marginal means=107·7 Kg/ha.
C.D. for Extra vs. others=85·2 Kg/ha.

**Crop :- Groundnut. (*Kharif*).** **Ref :- Ms. 61(144), 62(133).**
**Site :- Agri. Res. Stn., Bijapur.** **Type :- 'M'.**

Object :—To find out the effect of fertilizers on the yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Bajri* (c) 12·4 C.L./ha. of F.Y.M.; 12·4 C.L./ha. of F.Y.M.+2·2 Kg/ha. of N as A/S. (ii) Medium to medium loamy. (iii) 26.6.61 ; 30.6.62. (iv) (a) 3 ploughings and harrowings. (b) Drilling. (c) 112 Kg/ha. (d) 30 cm. between rows. (e) Nil. (v) Nil. (vi) Spanish improved (early). (vii) Unirrigated. (viii) 1 to 2 hand weedings and 2 interculturings. (ix) 43 cm ; 70 cm. (x) 30.10.61 ; 11.11.62.

3. TREATMENTS :

3 times of application of 134·5 Kg/ha. of N as A/S.

$T_0$=Control, $T_1=\frac{1}{2}$ dose at the time of sowing and $\frac{1}{2}$ dose one month after sowing and $T_2$=Full dose at the time of sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) 9·1 m.×7·3 m. (iii) 12. (iv) (a) 9·1 m.×2·4 m. (b) 7·9 m.×1·3 m. (v) 61 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Slight attack of Tikka disease. (iii) Yield of pods. (iv) (a) 1961 to 62. (b) No. (c) As under 5 Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and treatments×years interaction is absent.

5. RESULTS :

(i) 563 Kg/ha. (ii) 73·5 Kg/ha. (based on 46 d.f. made up of pooled error and treatments×years interaction). (iii) Treatment differences are significant. (iv) Av. yield of pods in Kg/ha.

| Treatments | $T_0$ | $T_1$ | $T_2$ |
|---|---|---|---|
| Av. yield | 528 | 581 | 580 |

C.D.=42·8 Kg/ha.

| | $T_0$ | $T_1$ | $T_2$ | Sig. | G.M. | Mean |
|---|---|---|---|---|---|---|
| 1961 | 656 | 660 | 684 | N.S. | 667 | 80·2 |
| 1962 | 401 | 502 | 475 | ** | 459 | 59·8 |
| Pooled | 528 | 581 | 580 | * | 563 | 73·5 |

**Crop :- Groundnut.** (*Kharif*). **Ref :- Ms. 64(87).**

**Site :- College of Agri., Dharwar.** **Type :- 'M'.**

Object :—To find out suitable placement method and kind of fertilizers for application to Groundnut in red soil.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Jowar*. (c) N.A. (ii) Red Sandy loam. (iii) 29.6.1964. (iv) (a) Ploughing, grubbing, clod crushing and harrowing. (b) Dibbling. (c) 112 Kg/ha. (d) 30 cm.×6 cm. (e) 1. (v) Nil. (vi) Spanish improved (early). (vii) Unirrigated. (viii) Interculturing and weeding. (ix) 72 cm. (x) 17.10.64.

2. TREATMENTS :

All combinations of (1) and (2) + a control

(1) 4 sources of 13 Kg/ha. of N : $S_1$=A/S, $S_2$=Urea, $S_3$=C/A/N and $S_4$=A/S/N.

(2) 3 methods of placement : $M_1$=N and P applied 12 cm. deep by plough sole a week before sowing, $M_2$= P applied 12 cm. deep by plough sole and N 5 cm. deep and 5 cm. away from seed at sowing and $M_3$=N and P applied in seed drill and seeds sown through draw tubes.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) 24·4 m.×29·3 m. (iii) 4. (iv) (a) 7·3 m.×6·1 m. (b) 6·1 m.×4·9 m. (v) Two rows on either side. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of pods. (iv) (a) 1964. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1281 Kg/ha. (ii) 80·7 Kg/ha. (iii) Main effects of M, S and control vs. others are highly significant. (iv) Av. yield of pods in Kg/ha.

Control=976 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $M_1$ | 1333 | 1423 | 1260 | 1416 | 1358 |
| $M_2$ | 1264 | 1261 | 1177 | 1160 | 1216 |
| $M_3$ | 1337 | 1453 | 1324 | 1266 | 1345 |
| Mean | 1311 | 1379 | 1254 | 1281 | 1306 |

C.D. for M marginal means=57·9 Kg/ha.

C.D. for S marginal means=66·9 Kg/ha.

C.D. for control vs. others means=85·3 Kg/ha.

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**Crop :- Groundnut.** **Ref :- Ms. 63(68), 64(41).**

**Site :- Agri. College Farm, Dharwar.** **Type :- 'M'.**

Object :—To find out suitable dose of fertilizer for erect type of Groundnut with F.Y.M.

1. BASAL CONDITIONS :

(i) (a) Cotton—Chilly—Groundnut—Jowar for 63(68); Cotton—Chilly—Groundnut for 64(41). (b) Cotton—Chilly for 63(68); Cotton for 64(41). (c) N.A. (ii) Medium black. (iii) 29.7.63; 4, 5.7.64. (iv) (a) N.A. for 63(68), up rooting of cotton sterbbles, loosening the soil with harrowing. (b) Drilling for 63(68) ; Dibbling for 64(41). (c) 247 Kg/ha. for 63(68), N.A. for 64(41). (d) 30 cm. between rows; N.A. for 64(41). (e) 1 for 63(68) ; N.A. for 64(41). (v) 12·4 C.L./ha. of F.Y.M. for 63(68) ; N.A. for 64(41). (vi) Spanish improved. (vii) Unirrigated. (viii) 1 weeding and 2 interculturings for 63(68) ; 3 hand weedings for 64(41). (ix) N.A. (x) 31.10.63 ; 23, 24.10.64.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N : $N_0$=0, $N_1$=22·2 and $N_2$=44·4 Kg/ha.
(2) 3 levels of $P_2O_5$ : $P_0$=0, $P_1$=22·2 and $P_2$=44·4 Kg/ha.
(3) 3 levels of $K_2O$ : $K_0$=0, $K_1$=22·2 and $K_2$=44·4 Kg/ha.

Fertilizers placed with the help of seed bowl.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 3 blocks/replication; 9 plots/block. (b) 27·4 m.×18·3 m. (iii) 2. (iv) (a) 9·1 m.×6·1 m. (b) 8·5 m.×5·5 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Poor for 63(68) ; Fair for 64(41). (ii) Nil. (iii) Weight of pods. (iv) (a) 1963 to 64. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous. treatments×years interaction is absent.

5. RESULTS :

(i) 1135 Kg/ha. (ii) 171·7 Kg/ha. (based on 62 d.f. made up of Treatments×years interaction and pooled error). (iii) Main effect of P is significant. (iv) Av. yield of pods in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 1050 | 1162 | 1159 | 1077 | 1115 | 1180 | 1124 |
| $N_1$ | 1104 | 1200 | 1236 | 1155 | 1178 | 1207 | 1180 |
| $N_2$ | 1051 | 1114 | 1138 | 1111 | 1083 | 1108 | 1101 |
| Mean | 1068 | 1158 | 1178 | 1114 | 1125 | 1165 | 1135 |
| $K_0$ | 1077 | 1096 | 1171 | | | | |
| $K_1$ | 1052 | 1068 | 1156 | | | | |
| $K_2$ | 1075 | 1212 | 1207 | | | | |

C.D. for P marginal means=80·8 Kg/ha.

| Years | $N_0$ | $N_1$ | $N_2$ | Sig. | $P_0$ | $P_1$ | $P_2$ | Sig. | $K_0$ | $K_1$ | $K_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1963 | 1097 | 1162 | 1116 | N.S. | 1044 | 1153 | 1178 | N.S. | 1091 | 1163 | 1121 | N.S. | 1125 | 175·7 |
| 1964 | 1150 | 1198 | 1085 | N.S. | 1093 | 1163 | 1177 | N.S. | 1137 | 1088 | 1208 | N.S. | 1144 | 177·9 |
| Pooled | 1124 | 1180 | 1101 | N.S. | 1068 | 1158 | 1178 | * | 1114 | 1125 | 1165 | N.S. | 1135 | 171·7 |

**Crop :- Groundnut** (*Kharif*). **Ref :- Ms. 63(67), 64(45).**

**Site :- Agri. College, Dharwar.** **Type :- 'M'.**

Object :—To test the efficiency of different seed treatments on getting better germination stand and yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Cotton+Chilly; Groundnut. (b) Cotton+Chilly; Cotton. (c) Nil. (ii) Medium black. (iii) 18.7.63; 30.6.64. (iv) (a) Harrowings. (b) Drilling ; dibbling. (c) and (d) N.A. (e) One. (v) Nil. (vi) Spanish improved. (vii) Unirrigated. (viii) 1—2 hand weedings and 2 interculturings. (ix) N.A.; 93 cm. (x) 24.10.63; 18.10.64.

2. TREATMENTS :

5 seed soaking treatments : $T_0$=Control, $T_2$=In water for 4 hours, $T_2$=In luke warm water for 4 hrs., $T_3$=In 2% Mono Amm. Phos. for 4 hrs. and $T_4$=In 1% Diammonium Phos. for 4 hrs.

3. DESIGN :

(i) L. Sq. (ii) (a) 5. (b) 45·7 m.×36·6 m. (iii) 5. (iv) (a) 9·1 m.×7·3 m. (b) 8·5 m.×6·7 m. (v) 30 cm.× 30 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of pods. (iv) (a) 1963 to 65 [1965 N.A]. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous. Treatments×years interaction is absent.

5. RESULTS :

(i) 1417 Kg/ha. (ii) 126·4 Kg/ha. (based on 28 d.f. made up of pooled error and interaction of treatments with years). (iii) Treatment differences are highly significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. yield | 1574 | 1388 | 1339 | 1368 | 1417 |

C.D.=114·7 Kg/ha.

| Years | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|
| 1963 | 1491 | 1248 | 1191 | 1165 | 1298 | * | 1279 | 131.6 |
| 1964 | 1658 | 1529 | 1487 | 1570 | 1536 | N.S. | 1556 | 116·7 |
| Pooled | 1574 | 1388 | 1339 | 1368 | 1417 | ** | 1417 | 126·4 |

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**Crop :- Groundnut** (*Kharif*). **Ref :- Ms. 63(69), 64(42).**

**Site :- Agri. College Farm, Dharwar.** **Type :- 'M'.**

Object :—To find out suitable dose of fertilizers without basal dose of F.Y.M. for Groundnut.

1. BASAL CONDITIONS :

(i) (a) Cotton—Chilly (mix)—Groundnut—*Jowar* for 63(69) ; Cotton—Chilly—Groundnut for 64(42). (b) Cotton+Chilly for 63(69) ; Cotton 64(42). (c) N.A. (ii) Medium black. (iii) 2.8.63 ; 5, 6.7.64. (iv) N.A. for 63(69) ; harrowing for 64(42). (b) Drilling for 63(69) ; dibbling for 64(42). (c) 247 Kg/ha. for 63(69) ; N.A. for 64(42). (d) 30 cm. between rows for 63(69) ; N.A. for 64(42). (e) 1 for 63(69), N.A. for 64(42). (v) Nil. (vi) Spanish improved (early). (vii) Unirrigated. (viii) 1 weeding and 2 interculturings for 63(69) ; 3 hand weedings and 2 interculturings for 64(42). (ix) N.A. (x) 31.10.63; 24 and 25.10.64.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=22{\cdot}4$ and $N_2=44{\cdot}8$ Kg/ha.

(2) 3 levels of $P_2O_5$ as Super : $P_0=0$, $P_1=22{\cdot}4$ and $P_2=44{\cdot}8$ Kg/ha.

(3) 3 levels of $K_2O$ as Mur. Pot. : $K_0=0$, $K_1=22{\cdot}4$ and $K_2=44{\cdot}8$ Kg/ha.

Fertilizers are placed within the rows with the help of seed bowl.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 3 blocks/replication; 9 plots/block. (b) 27·4 m.×18·3 m. (iii) 2. (iv) (a) 9·1 m.× 6·1 m. (b) 8·5 m.×5·5 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Poor for 63(69) ; Fair for 64(42). (ii) Nil. (iii) Yield of pods. (iv) (a) 1963—64. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Error variances are heterogeneous. Treatments×years interaction is absent.

5. RESULTS :

63(69)

(i) 1080 Kg/ha. (ii) 148·2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 991 | 1098 | 1133 | 1030 | 1135 | 1057 | 1074 |
| $N_1$ | 1103 | 1057 | 1065 | 988 | 1076 | 1161 | 1075 |
| $N_2$ | 966 | 1135 | 1173 | 1022 | 1101 | 1151 | 1091 |
| Mean | 1020 | 1097 | 1124 | 1013 | 1104 | 1123 | 1080 |
| $K_0$ | 902 | 1063 | 1075 | | | | |
| $K_1$ | 1042 | 1135 | 1135 | | | | |
| $K_2$ | 1116 | 1092 | 1161 | | | | |

64(42)

(i) 1495 Kg/ha. (ii) 269·7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 1661 | 1260 | 1648 | 1517 | 1544 | 1508 | 1523 |
| $N_1$ | 1501 | 1536 | 1404 | 1479 | 1471 | 1491 | 1480 |
| $N_2$ | 1501 | 1372 | 1571 | 1266 | 1658 | 1526 | 1481 |
| Mean | 1554 | 1389 | 1541 | 1419 | 1558 | 1508 | 1495 |
| $K_0$ | 1484 | 1400 | 1372 | | | | |
| $K_1$ | 1658 | 1347 | 1668 | | | | |
| $K_2$ | 1521 | 1421 | 1583 | | | | |

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**Crop :- Groundnut** (*Kharif*). **Ref :- Ms. 60(133), 61(109), 62(112), 63(53).**

**Site :- Agri. College Farm,**
**Dharwar.**

**Type :- 'M'.**

Object :—To find out suitable methods of placement of fertilizers to Groundnut in black soil.

1. BASAL CONDITIONS :

(i) (a) Groundnut+Wheat—*Jowar*—Chilly+Cotton for 63(53) ; N.A. for others. (b) Chilly+Cotton for 63(53), N.A. for others. (c) 5 C.L./ha. of F.Y.M.+30 Kg/ha. of N+20 Kg/ha. of $P_2O_5$. (ii) Deep black soil for 63(53) ; Black clayey for 60(133) ; Black clay loam for others. (iii) 6.7.60 ; 28.6.61; 17.7.62, 6.7.63. (iv) (a) Ploughing and harrowing for 60(133), 3 harrowings for 63(53) ; normal ploughings for others. (b) Drilling for 60(133), N.A. for others. (c) 247 Kg/ha. for 60(133) N.A. for others. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) Spanish improved. (vii) Unirrigated. (viii) Nil for 63(53) ; interculturing and weeding for others. (ix) 39 cm. for 60(133) ; N.A. for others. (x) 15 and 16.10.60 ; 6.10.61 ; 25.10.62 and 19.10.63.

2. TREATMENTS :

All combinations of (1) and (2)+one control.

(1) 2 levels of fertilizers : $L_1$=22·4 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ and $L_2$=33·6 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$.

(2) 4 methods of application of fertilizers : $M_1$=By plough sole method (12 cm. deep, one week before sowing), $M_2$=To drop the fertilizers in the same line where the seed is sown, $M_3$=To place the fertilizers 4 cm. deeper than the seed by draw tube and $M_4$=To drop the fertilizer 5 cm. away and 5 cm. deep from the seed.

Fertilizers were dropped by seed cum fertilizer drill.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×7·8 m. (b) 7·3 m.×6·1 m. (v) 91 cm.× 61 cm. (vi) Yes.

4. GENERAL :

(i) Good for 63(53) ; Normal for others. (ii) Nil. (iii) Yield of pods. (iv) (a) 1960 to 63. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous. Treatments×years interaction is present.

5. RESULTS :

(i) 2624 Kg/ha. (ii) 235·3 Kg/ha. (based on 21 d.f. made up of treatments×years interaction). (iii) Only the effect of control *vs*. others is significant. (iv) Av. yield of pods in Kg/ha.

Control mean=2245 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $L_1$ | 2647 | 2618 | 2598 | 2563 | 2607 |
| $L_2$ | 2720 | 2739 | 2733 | 2747 | 2735 |
| Mean | 2684 | 2679 | 2665 | 2655 | 2671 |

C.D. for control *vs*. others=126·8 Kg/ha.

| Years | Control | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Sig. | $L_1$ | $L_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 1806 | 2190 | 2203 | 2153 | 2194 | N.S. | 2184 | 2187 | N.S. | 2143 | 149·9 |
| 1961 | 1945 | 2206 | 2276 | 2403 | 2410 | * | 2206 | 2441 | ** | 2282 | 144·9 |
| 1962 | 2301 | 2972 | 2931 | 2752 | 2880 | * | 2815 | 2953 | ** | 2819 | 143·8 |
| 1963 | 2929 | 3364 | 3302 | 3352 | 3138 | N.S. | 3220 | 3358 | N.S. | 3249 | 211·3 |
| Pooled | 2245 | 2684 | 2679 | 2665 | 2655 | * | 2607 | 2735 |  | 2624 | 235·3 |

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**Crop :- Groundnut** (*Kharif*). **Ref :- Ms. 60(142), 61(110), 62(111), 63(54).**

**Site :- Agri. College Farm, Dharwar.** **Type :- 'M'.**

Object :—To find out suitable placement method of application of fertilizers to Groundnut in red soil.

1. BASAL CONDITIONS :

(i) (a) N.A. for 60(142), 61(110) and 62(111) ; Groundnut+Wheat—*Jowar*—Chillies (mixture) for 63(54). (b) Chilly—Cotton for 63(54) ; N.A. for others. (c) 12·4 C.L./ha. of F.Y.M. for 63(54) ; N.A. for others. (ii) Deep red sandy loam for 60(142) ; 61(110) ; red sandy loam for 62(111); Light red soil for 63(54). (iii) 6.7.60, 27.6.61, 16.7.62 and 4.7.63. (iv) (a) Ploughing and harrowing for 60(142), 61(110), 62(111), 3 harrowings for 63(54). (b) Drilling for 60(142), 61(110) ; N.A. for others. (c) 112 Kg/ha. for 60(142), N.A. for others. (d) 30 cm. between rows for 60(142), 61(110), N.A. for others. (e) N.A. (v) Nil. (vi) Nil. (vii) Spanish improved. (vii) Unirrigated. (viii) Interculturings and weedings. (ix) 39 cm. for 60(142) ; N.A. for others. (x) 10 to 12.10.60 ; 11.10.61 ; 7.10.62 and 9.10.63.

2. TREATMENTS :

Same as in Expt. nos. 60(133), 61(109), 62(112) and 63(53) on page 484.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×6·1 m. for 63(54) ; 9·1 m.×7·3 m. for others. (b) 7·3 m.×4·9 m. for 63(54) ; 7·3 m.×6·1 m. for others. (v) 61 cm.×91 cm. for 63(54) ; 61 cm.× 61 cm. for others. (vi) Yes.

4. GENERAL :

(i) Good for 63(54) ; normal for others. (ii) Nil. (iii) Yield of pods. (iv) (a) 1960—63. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Error variances are heterogeneous. Treatments×years interaction is absent.

5. RESULTS :

60(142)

(i) 1788 Kg/ha. (ii) 394·7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

Control mean=1564 Kg/ha.

|  | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $L_1$ | 1849 | 1803 | 1906 | 1636 | 1798 |
| $L_2$ | 1958 | 1744 | 1946 | 1689 | 1834 |
| Mean | 1904 | 1774 | 1926 | 1662 | 1816 |

**61(110)**

(i) 1311 Kg/ha. (ii) 153·2 Kg/ha. (iii) Main effect of M is significant. (iv) Av. yield of pods in Kg/ha.

Control mean=1259 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $L_1$ | 1208 | 1259 | 1449 | 1132 | 1262 |
| $L_2$ | 1265 | 1526 | 1373 | 1322 | 1372 |
| Mean | 1236 | 1392 | 1411 | 1227 | 1317 |

C.D. for M marginal means=158·1 Kg/ha.

**62(111)**

(i) 1511 Kg/ha. (ii) 128·8 Kg/ha. (iii) Main effect of L and control *vs.* others are significant. (iv) Av. yield of pods in Kg/ha.

Control mean=1214 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $L_1$ | 1386 | 1519 | 1475 | 1462 | 1460 |
| $L_2$ | 1640 | 1596 | 1666 | 1638 | 1635 |
| Mean | 1513 | 1558 | 1570 | 1550 | 1548 |

C.D. for L marginal means=93·9 Kg/ha.
C.D. for control *vs.* others=141·0 Kg/ha.

**63(54)**

(i) 2717 Kg/ha. (ii) 282·1 Kg/ha. (iii) Only 'control *vs.* others' is significant. (iv) Av. yield of pods in Kg/ha.

Control mean=2411 Kg/ha.

| | $M_1$ | $M_2$ | $M_3$ | $M_4$ | Mean |
|---|---|---|---|---|---|
| $L_1$ | 2676 | 2709 | 3026 | 2383 | 2698 |
| $L_2$ | 2680 | 2922 | 2840 | 2804 | 2812 |
| Mean | 2678 | 2816 | 2933 | 2594 | 2755 |

C.D. for control *vs.* others=308·7 Kg/ha.

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**Crop :- Groundnut.** **Ref :- Ms. 64(53).**
**Site :- Agri. Res. Stn., Gangavati.** **Type :- 'M'.**

Object :—To study the optimum combination of N, P and K for irrigated Groundnut.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Groundnut. (b) *Jowar.* (c) 12·4 C.L./ha. of F.Y.M. (ii) Slightly alkaline with calcium pebbles. (iii) 22.2.64. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) to (e) N.A. (v) 12·4 C.L./ha. of F.Y.M. (vi) TMV—2 (early). (vii) Irrigated. (viii) Hand weeding and 2 interculturings. (ix) N.A. (x) 4.7.1964.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=22·4$ and $N_2=44·8$ Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_0=0$, $P_1=33·6$ and $P_2=67·2$ Kg/ha.
(3) 3 levels of $K_2O$ (source N.A.) $K_0=0$, $K_1=22·4$ and $K_2=44·8$ Kg/ha.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 9·1 m.×6·1 m. (b) 8·5 m.×5·5 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Attack of Aphids—sprayed Endrin. (iii) No. of developed and undeveloped seeds and yield data. (iv) (a) 1964 only. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Expt. conducted by Asstt. Agronomist, Groundnut Scheme, Agri. College, Dharwar.

5. RESULTS :

(i) 1108 Kg/ha. (ii) 258·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 850 | 1143 | 1007 | 961 | 936 | 1103 | 1100 |
| $N_1$ | 1135 | 1292 | 1139 | 1289 | 1086 | 1191 | 1189 |
| $N_2$ | 1111 | 1264 | 1029 | 1011 | 1039 | 1354 | 1135 |
| Mean | 1032 | 1233 | 1058 | 1087 | 1020 | 1216 | 1108 |
| $K_0$ | 982 | 1267 | 1012 | | | | |
| $K_1$ | 1057 | 1128 | 876 | | | | |
| $K_2$ | 1057 | 1304 | 1287 | | | | |

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**Crop :- Groundnut (*Kharif*).** **Ref :- Ms. 60(16), 61(65), 62(63).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'M'.**

Object :—To find out the optimum dose of N, P and K for Groundnut crop.

1. BASAL CONDITIONS :

(i) (a) *Ragi*—Groundnut. (b) *Ragi.* (c) 9·9 C.L./ha. of compost. (ii) Red loam for 61(65) ; sandy loam for others. (iii) 18.7.60; 22.6.61; 7.8.62. (iv) (a) Ploughing and harrowing for 60(16) ; passing chippa kunta for 61(65) ; ploughings for 62(53). (b) Dibbling for 60(16) ; drilling for others. (c) 112 Kg/ha. for 60(16) ; 89 Kg/ha. for others. (d) 30 cm.×15 cm. (e) 1. (v) 9·9 C.L./ha. of compost. (vi) H.G.—10 (Bunch late). (vii) Unirrigated. (viii) Hand weeding. (ix) 69 cm, 84 cm; 106 cm ; (x) 29.12.60 : 13.11.61 ; 18.12.62.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : $N_0$=0, $N_1$=16·8 and $N_2$=33·6 Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_0$=0, $P_1$=16·8 and $P_2$=33·6 Kg/ha.
(3) 3 levels of $K_2O$ as Mur. Pot. : $K_0$=0, $K_1$=16·8 and $K_2$=33·6 Kg/ha.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 3 blocks/replication ; 9 plots/block. (b) 44·5 m.×37·2 m. for 62(53) ; N.A. for others. (iii) 4. (iv) (a) 11·9 m.×4·6 m. for 60(16) ; 11·6 m.×4·3 m. for others. (b) 11·3 m.×4·0 m. for 60(16), 11·0 m.×3·7 m. for others. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Plant growth effected—due to lack of rain for 60(16) and 61(65) due to late sowing for 62(53). (ii) A mild attack of Tikka for 60(16), mild attack of leaf minor and Tikka for 61(65), no control measures taken ; Nil for 62(53). (iii) Yield of pods. (iv) (a) 1960 to 62. (b) No. (c) As under 5 results. (v) and (vi) Nil. (vii) Error variances are homogeneous. Treatments×years interaction is present.

5. RESULTS :

(i) 708 Kg/ha. (ii) 241·8 Kg/ha. (made up of 36 d.f. made up of interaction of treatments with years). (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 648 | 660 | 717 | 664 | 706 | 654 | 675 |
| $N_1$ | 696 | 755 | 748 | 755 | 782 | 662 | 733 |
| $N_2$ | 669 | 711 | 765 | 721 | 724 | 700 | 715 |
| Mean | 671 | 709 | 743 | 713 | 738 | 672 | 708 |
| $K_0$ | 694 | 706 | 740 | | | | |
| $K_1$ | 688 | 743 | 782 | | | | |
| $K_2$ | 631 | 677 | 708 | | | | |

| Years | $N_0$ | $N_1$ | $N_2$ | Sig. | $P_0$ | $P_1$ | $P_2$ | Sig. | $K_0$ | $K_1$ | $K_2$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 520 | 463 | 387 | * | 482 | 430 | 458 | N.S. | 454 | 433 | 482 | N.S. | 457 | 94·9 |
| 1961 | 1118 | 1269 | 1287 | * | 1128 | 1251 | 1295 | * | 1241 | 1300 | 1133 | * | 1224 | 238·9 |
| 1962 | 386 | 468 | 471 | * | 403 | 445 | 477 | * | 445 | 480 | 401 | * | 442 | 37·0 |
| Mean | 675 | 733 | 715 | N.S. | 671 | 709 | 743 | N.S. | 713 | 738 | 672 | N.S. | 708 | 241·8 |

**Crop :- Groundnut (*Kharif*).** **Ref :- Ms. 62(267), 64( 91).**

**Site :- Agri. Res. Stn., Raichur.** **Type :- 'M'.**

Object :—To study the effect of phosphatic fertilizers on Groundnut and the residual effect on *Kharif Jowar*.

1. BASAL CONDITIONS :

(i) (a) Groundnut—*Jowar*. (b) *Jowar*. (c) N.A. ; 12·4 C.L./ha. of F.Y.M. (ii) Red soil. (iii) 30.6.62 ; N.A. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) and (d) N.A. (e) Nil. (v) 12·4 C.L./ha. of F.Y.M. (vi) TMV—2. (vii) Unirrigated. (viii) weeding and interculturing. (ix) 84 cm. ; 89 cm. (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 levels of N as A/S : $N_1$=65·1 and $N_2$=130·2 Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_1$=130·2, $P_2$=260·4 and $P_3$=390·6 Kg/ha.
(3) 2 levels of $K_2O$ as Mur. of Pot. : $K_0$=0 and $K_1$=20·1 Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 7·6 m.×4·6 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of pods. (iv) (a) 1962 to 64 (1963 N.A.). (b) Yes. (c) As under 5. results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and treatments×years interaction is present.

5. RESULTS :

(i) 1815 Kg/ha. (ii) 476·0 Kg/ha. (based on 9 d.f. made up of interaction of treatments with years). (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

| | $P_1$ | $P_2$ | $P_3$ | $K_0$ | $K_1$ | Mean |
|---|---|---|---|---|---|---|
| $N_1$ | 1787 | 1952 | 1718 | 1807 | 1831 | 1819 |
| $N_2$ | 1745 | 1890 | 1798 | 1787 | 1835 | 1811 |
| Mean | 1766 | 1921 | 1758 | 1797 | 1833 | 1815 |
| $K_0$ | 1736 | 1910 | 1744 | | | |
| $K_1$ | 1796 | 1932 | 1772 | | | |

| Years | $P_1$ | $P_2$ | $P_3$ | Sig. | $K_0$ | $K_1$ | Sig. |
|---|---|---|---|---|---|---|---|
| 1962 | 2011 | 2257 | 1992 | N.S. | 1946 | 2227 | * |
| 1964 | 1521 | 1585 | 1524 | N.S. | 1648 | 1439 | * |
| Mean | 1766 | 1921 | 1758 | N.S. | 1797 | 1833 | N.S. |

| $N_1$ | $N_2$ | Sig | G.M. | S.E./plot |
|---|---|---|---|---|
| 2028 | 2145 | N.S. | 2087 | 348·6 |
| 1610 | 1477 | N.S. | 1543 | 292·1 |
| 1819 | 1811 | N.S. | 1815 | 476·0 |

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**Crop :- Groundnut** (*Kharif*). **Ref :- Ms. 65(98).**

**Site :- Agri. Res. Stn., Saundatti.** **Type :- 'M'.**

Object :—To find out the optimum combination of N, P and K for Groundnut under dry conditions.

1. BASAL CONDITIONS :

(i) (a) Groundnut—*Jowar*. (b) *Jowar*. (c) 33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ while sowing. (ii) Medium black. (iii) 21.7.65. (iv) (a) Ploughing and harrowing 4 times. (b) Hand dibbling. (c) N.A. (d) 30 cm.×8 cm. (e) 2. (v) 5 C.L./ha. of F.Y.M. applied one month before sowing. (vi) Erect type. (vii) Unirrigated. (viii) 3 times interculturing with hoeing, 2 times hand weeding. (ix) 48 cm. (x) 17th and 18th November 65.

2. TREATMENTS:

All combinations of (1), (2) and (3)

(1) 3 levels of N : $N_1$=11·2, $N_2$=16·8 and $N_3$=22·4 Kg/ha.
(2) 3 levels of $P_2O_5$ : $P_1$=11·2, $P_2$=16·8 and $P_3$=22·4 Kg/ha.
(3) 3 levels of $K_2O$ : $K_1$=5·6, $K_2$=11·2 and $K_3$=16·8 Kg/ha.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 12·2 m.×4·9 m. (b) 11·0m.×3·7m. (v) Yes. (2 rows on each side). (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of pods. (iv) (a) 1965—N.A. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 937 Kg/ha. (ii) 92·7 Kg/ha. (iii) Main effect of P and interaction NP are significant. (iv) Av. yield of pods in Kg/ha.

| | $P_1$ | $P_2$ | $P_3$ | $K_1$ | $K_2$ | $K_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_1$ | 802 | 1034 | 947 | 876 | 951 | 955 | 928 |
| $N_2$ | 968 | 959 | 1001 | 955 | 984 | 988 | 976 |
| $N_3$ | 889 | 856 | 980 | 914 | 939 | 872 | 908 |
| Mean | 886 | 950 | 976 | 915 | 958 | 938 | 937 |
| $K_1$ | 856 | 951 | 939 | | | | |
| $K_2$ | 926 | 955 | 993 | | | | |
| $K_3$ | 876 | 943 | 997 | | | | |

C.D. for P marginal means=64·1 Kg/ha.
C.D. for body of NP table=111·0 Kg/ha.

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**Crop :- Groundnut** (*Kharif*). **Ref :- Ms.63(75), 63(72).**

**Site :- Hangerki, Harabelawadi (Dharwar,** *c.f.*). **Type :- 'M'.**

Object :—To find the suitable manurial doses for increasing the yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Black soil. (iii) Nil. (iv) Spanish improved, (v) (a) to (e) N.A. (vi) 15.7.63. 16.7.63. (vii) Unirrigated. (viii) 2 to 3 interculturings and hand weeding. (ix) N.A. (x) 20.10.63 ; 18.10.63.

2. TREATMENTS :

8 manurial treatments : $T_0$=Control, $T_1$=12·4 C.L./ha. of F.Y.M., $T_2$=22·4/Kg/ha. of N, $T_3$=33·6 Kg/ha. of $P_20_5$, $T_4$=33·6 Kg/ha. of $K_2O$., $T_5$=22·4 Kg/ha. of N+33·6 Kg/ha. of $P_20_5$, $T_6$= 22·4 Kg/ha. of N+33·6 Kg/ha. of $P_20_5$+33·6 Kg/ha. of $K_2O$ and $T_7$=12·4 C.L./ha. of F.Y.M.+22·4 Kg/ha. of N+33·6 Kg/ha. of $P_20_5$+33·6 Kg/ha. of $K_2O$.
Fertilizers were placed in the row with the help of seed bowl.

3. DESIGN :

(i) R.B.D. with 8 plots/block and 4 replications. (ii) N.A. (iii) (a) 21·9 m × 9·1 m. (b) 21·0 m.× 8.4 m., 21·3 m.× 8·5 m. (iv) N.A.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of pods. (iv) (a) 63 to 65 (64 & 65 N.A.) (b) N.A. (c) As under 5. results. (v) Distt. Raichur 64(37). (vi) N.A. (vii) Error variances are homogeneous. Treatments × years interaction is present.

5. RESULTS :

(i) 461 Kg/ha. (ii) 50·1 Kg/ha. (based on 7 d.f. made up of treatments × years interaction). (iii) Treatments differences are highly significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 402 | 408 | 412 | 485 | 412 | 491 | 530 | 551 |

C.D.=59·2 Kg/ha.

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**Crop :- Groundnut.** **Ref :- Ms. 64(37).**

**Site :- Koppal (Raichur, *c.f.*)** **Type :- 'M'.**

Object :—To find out suitable manurial dose for increasing the yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M. (ii) Red soil. (iii) As per treatments. (iv) N.A. (v) (a) to (e) N.A. (vi) 27.6.1964. (vii) Unirrigated. (viii) 2 hand weedings and 1 interculturing. (ix) N.A. (x) 15.11.1964.

2. TREATMENTS :

Same as in expt. no. 63 (75), 63(72), on page 490.

3. DESIGN :

(i) R.B.D. with 8 plots/block and 4 replications. (ii) N.A. (iii) (a) 9·1 m.× 7·3 m. (b) 8·4 m. 6·7 m. (iv) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of pods. (iv) (a) and (b) No. (c) Nil. (v) Viliages Hangerki and Harabelawadi (Distt Dharwar). (vi) Nil. (vii) Expt. conducted by Asstt. Agronomist, Groundunt scheme—Agri. College, Dharwar.

5. RESULTS :

(i) 1319 Kg/ha. (ii) 292·3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

| Tteatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 1170 | 1566 | 1281 | 1557 | 1281 | 1254 | 1276 | 1169 |

**Crop :- Groundnut.** **Ref :- Ms. 60, 62, 63, 64(M.A.E.).**

**Site :- M.A.E. Centre, Gangavati.** **Type :- 'M'.**

Object :—Type II : To study the residual effect of different levels of N, P and K and F.Y.M. on Groundnut.

1, BASAL CONDITIONS :

(i) (a) *Jowar*—Groundunt—Cotton. (b) *Jowar.* (c) As per treatments. (ii) Deep black for 60 ; Medium black for others. (iii) N.A. for 60 ; 22.1.1962 ; 15.1.1963 ; 1.2.1964. (iv) (a) Ploughing and harrowing. (b) By hand drill. (c) 89·7 Kg/ha. (d) 30 cm.× 10 to 12 cm. (e) —. (v) Nil. (vi) T.M.V.—2. (vii) Irrigated. (viii) Weeding and interculturings. (ix) N.A. (x) N.A. for 60 ; 24, 25.5.1962 ; 21.5.1963 ; 14.6.1964.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4).

(1) 3 levels of N as A/S : $N_0=0$, $N_1=22·4$ and $N_2=44·8$ Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_0=0,=P_1=22·4$ and $P_2=44·8$ Kg/ha.
(3) 3 levels of $K_2O$ as Mur. Pot. : $K_0=0$, $K_1=22·4$ and $K_2=44·8$ Kg/ha.
(4) 2 levels of F.Y.M. : $F_0=0$ and $F_1=5600$ Kg/ha.

3. DESIGN :

(i) $3^3\times 2$ Fact. confd. (ii) (a) 9 plots/block ; 6 blocks/replication. (b) N.A. (iii) I. (iv) (a) 15·5m.× 6·7 m. (b) 13·3 m.×6·1 m. (v) 113 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. for 60 ; attack of leaf minor forth. Folidol and Endrin sprayed. (iii) Yield of pods (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

60(MAE).

(i) 519 Kg/ha. (ii) 139·7 Kg/ha. (iii) None of the effects is significant, (iv) Av. yield of pod in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 599 | 526 | 609 | 535 | 581 | 618 | 627 | 553 | 554 | 578 |
| $F_1$ | 461 | 470 | 452 | 406 | 452 | 525 | 470 | 443 | 470 | 461 |
| Mean | 530 | 498 | 530 | 470 | 516 | 572 | 548 | 498 | 512 | 519 |
| $K_0$ | 609 | 526 | 509 | 461 | 563 | 620 | | | | |
| $K_1$ | 470 | 535 | 489 | 461 | 527 | 506 | | | | |
| $K_2$ | 511 | 433 | 592 | 488 | 458 | 590 | | | | |
| $P_0$ | 424 | 489 | 497 | | | | | | | |
| $P_1$ | 553 | 498 | 497 | | | | | | | |
| $P_2$ | 613 | 507 | 596 | | | | | | | |

62(MAE).

(i) 920 Kg/ha. (ii) 164·4 Kg/ha. (iii) Interaction N×K alone is significant. (iv) Av. yield of pods in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 876 | 867 | 945 | 892 | 879 | 917 | 911 | 910 | 869 | 896 |
| $F_1$ | 848 | 944 | 1038 | 858 | 940 | 1032 | 976 | 851 | 1003 | 943 |
| Mean | 862 | 905 | 992 | 875 | 910 | 975 | 943 | 880 | 936 | 920 |
| $K_0$ | 981 | 831 | 1018 | 885 | 934 | 1011 | | | | |
| $K_1$ | 777 | 1001 | 862 | 819 | 929 | 893 | | | | |
| $K_2$ | 829 | 884 | 1095 | 921 | 866 | 1020 | | | | |
| $P_0$ | 733 | 842 | 1051 | | | | | | | |
| $P_1$ | 861 | 801 | 967 | | | | | | | |
| $P_2$ | 992 | 973 | 958 | | | | | | | |

C.D. for body of N×K table=195·9 Kg/ha.

63(MAE).

(i) 1092 Kg/ha. (ii) 275·1 Kg/ha. (iii) Main effects of F, N, P and K are highly significant. (iv) Av. yield of pods in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 989 | 896 | 769 | 600 | 992 | 1062 | 806 | 805 | 1043 | 885 |
| $F_1$ | 1561 | 1218 | 1118 | 1211 | 1381 | 1306 | 1221 | 1168 | 1508 | 1299 |
| Mean | 1275 | 1057 | 943 | 906 | 1186 | 1184 | 1014 | 986 | 1276 | 1092 |
| $K_0$ | 1233 | 954 | 854 | 791 | 989 | 1262 | | | | |
| $K_1$ | 1181 | 989 | 789 | 750 | 1173 | 1036 | | | | |
| $K_2$ | 1411 | 1229 | 1187 | 1177 | 1396 | 1254 | | | | |
| $P_0$ | 993 | 883 | 841 | | | | | | | |
| $P_1$ | 1450 | 1148 | 961 | | | | | | | |
| $P_2$ | 1383 | 1140 | 1028 | | | | | | | |

C.D. for N, P or K marginal means=189·3 Kg/ha.

C.D. for F marginal means=154·6 Kg/ha.

64(MAE)

(i) 522 Kg/ha. (ii) 155·6 Kg/ha. (iii) Main effect of P alone is highly significant. (iv) Av. yield of pods in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 563 | 538 | 471 | 479 | 544 | 549 | 553 | 536 | 483 | 524 |
| $F_1$ | 503 | 478 | 578 | 359 | 584 | 615 | 492 | 467 | 600 | 520 |
| Mean | 533 | 508 | 524 | 419 | 564 | 582 | 522 | 501 | 542 | 522 |
| $K_0$ | 553 | 555 | 459 | 420 | 581 | 566 | | | | |
| $K_1$ | 472 | 516 | 516 | 348 | 635 | 520 | | | | |
| $K_2$ | 573 | 454 | 598 | 489 | 476 | 660 | | | | |
| $P_0$ | 438 | 447 | 372 | | | | | | | |
| $P_1$ | 545 | 510 | 637 | | | | | | | |
| $P_2$ | 616 | 567 | 563 | | | | | | | |

C.D. for P marginal means=107·1 Kg/ha.

**Crop :- Groundnut (*Rabi*).** **Ref :- Ms. 62 (S.F.T.).**

**Site :- (District) Mysore.** **Type :- 'M'.**

Object :—Type $A_1$ : To study the response curves of important cereal, cash and oilseed crops to Nitrogen applied singly and in combination with other nutrients.

1- BASAL CONDITIONS :

(i) N.A. (ii) Red sandy. (iii) to (vi) N.A. (vii) Irrigatd. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :

O =Control (no manure).
$N_1$ =15 Kg/ha. of N.
$N_2$ =30 Kg/ha. of N.
$P_1$ =30 Kg/ha. of $P_2O_5$.
$N_1P_1$ =15 Kg/ha. of N+30 Kg/ha. of $P_2O_5$.
$N_2P_1$ =30 Kg/ha. of N+30 Kg/ha. of $P_2O_5$.
$N_2P_2$ =30 Kg/ha. of N+60 Kg/ha. of $P_2O_5$.
$N_2P_2K_1$ =30 Kg/ha. of N+60 Kg/ha. of $P_2O_5$+30 Kg/ha. of $K_2O$.

N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

(a) and (ii) A selected district is divided into four agriculturally homogeneous zones based on climate, soil, cropping pattern, etc. In each zone one block is selected at random. A block normally consists of a group of 50-100 villages. In each block 36 experiments are conducted in a year of which 11 are of type $A_1$, 11 of type $A_2$, 11 of type $A_3$ and 3 are of type C. The eleven experiments under type $A_1$, $A_2$ and $A_3$ are distributed as 3 on a *Kharif* cereal, 3 on a *rabi* cereal, 3 on a cash crop and 2 on oilseed. All the three type—C experiments are conducted on a legume crop. For the purpose of conducting the $A_1$, $A_2$ and $A_3$ experiments 11 villages are randomly selected in each block and in each village 3 experiments one each of type $A_1$, $A_2$ and $A_3$ are laid out. For conducting the three type C trials three villages are randomly selected in each block. (iii) (a) 1/100 ha. (b) 1/200 ha. (iv) Yes.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962—only. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 15 | 30 | 89 | 103 | 97 | 221 | 317 | 9·8 |

Control yield=549 Kg/ha. ; No. of trials=2.

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**Crop :- Groundnut (*Rabi*).** **Ref :- Ms. 64, 65 (S.F.T.) for N. Kanara and 65 (S.F.T.) for Bellary.**

**Site :- (District) : Bellary and N. Kanara.** **Type :- 'M'.**

Object :—Type $A_1$ : To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Laterite for N. Kanara and Red sandy for Bellary. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS : and 3. DESIGN :

Same as in Type $A_1$ (*Rabi* Irrigated) on page 494.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1964 to 1965 for N. Kanara and 1965—only for Bellary. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

**Bellary**

65(S.F.T.)

| Treatment<br>Av. response of pods in Kg/ha. | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.F. |
|---|---|---|---|---|---|---|---|---|
| | 322 | 537 | 373 | 490 | 703 | 692 | 720 | 114·9 |

Control yield=1245 Kg/ha. ; No. of trials=2.

**N. Kanara**

64 (S.F.T.)

| Treatment<br>Av. response of pods in Kg/ha. | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| | 227 | 321 | 234 | 329 | 433 | 540 | 633 | 42·1 |

Control yield=1451 Kg/ha. ; No. of trials=8.

65(S.F.T.)

| Treatment<br>Av. response of pods in Kg/ha. | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| | 42 | 329 | 131 | 625 | 578 | 945 | 975 | 143·8 |

Control yield=2274 Kg/ha. ; No. of trials=5.

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**Crop :- Groundnut (*Kharif*).**

**Ref. :- Ms. 64 (S.F.T.) for Mandya and Bangalore and 64, 65 (S.F.T.) for others.**

**Site :- (District) : Bellary, Belgaum, Bangalore, Mysore & Mandya.**

**Type :- 'M'.**

Object :—Type $A_1$ : To study the response curves of important cereal, cash and oilseed crops to Nitrogen applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red loamy for Bangalore; Deep black for Belgaum ; and Red sandy for others. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :
O =Control (no manure).
$N_1$ =15 Kg/ha. of N.
$N_2$ =30 Kg/ha. of N.
$P_1$ =20 Kg/ha. of $P_2O_5$.
$N_1P_1$ =15 Kg/ha. of N+20 Kg/ha. of $P_2O_5$.
$N_2P_1$ =30 Kg/ha. of N+20 Kg/ha. of $P_2O_5$.
$N_2P_2$ =30 Kg/ha. of N+40 Kg/ha. of $P_2O_5$.
$N_2P_2K_1$=30 Kg/ha. of N+40 Kg/ha. of $P_2O_5$+20 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in type $A_1$ (*Rabi* Irrigated) on page 494.

4. GENERAL INFORMATION:

(i) to (iii) N.A. (iv) (a) 1964 to 1966 [1965 N.A. for Bangalore] for Belgaum and Bangalore; 1964 to 1965 for Bellary and Mysore ; 1964—only for Mandya. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**Bellary**

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 192 | 285 | 114 | 282 | 364 | 415 | 533 | 61·5 |

Control yield=849 Kg/ha. ; No. of trials=4.

65(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 38 | 85 | 25 | 107 | 133 | 144 | 142 | 52·2 |

Control yield=431 Kg/ha. ; No. of trials=3.

**Belgaum**

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 148 | 355 | 388 | 395 | 450 | 540 | 708 | 53·9 |

Control yield=1156 Kg/ha. ; No. of trials=4.

65(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 187 | 204 | 132 | 203 | 279 | 398 | 532 | 70·5 |

Control yield=1286 Kg/ha. ; No. of trials=4.

**Banglore**

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 171 | 184 | 134 | 228 | 286 | 341 | 385 | 54·3 |

Control yield=1585 Kg/ha. ; No. of trials=3.

**Mandya**

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 148 | 148 | 148 | 222 | 296 | 345 | 444 | 49·1 |

Control yield=642 Kg/ha. ; No. of trials=2.

**Mysore**

64(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $P_1$ | $N_1P_1$ | $N_2P_1$ | $N_2P_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 1272 | 1275 | 130 | 1261 | 1446 | 1720 | 2072 | 358·9 |

Control yield=2185 Kg/ha. ; No. of trials=2.

65(S.F.T.)

| Treatment | $N_1$ | $N_2$ | $K_1$ | $N_1K_1$ | $N_2K_1$ | $N_2K_2$ | $N_2P_2K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 170 | 200 | 100 | 250 | 300 | 520 | 520 | 132·8 |

Control yield=525 Kg/ha. ; No. of trials=2.

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**Crop :- Groundnut** (*Rabi*). **Ref :- Ms. 62 (S.F.T.) for Mysore ; 65 (S.F.T.) for Bellary.**

**Site :- (District) : Mysore and Bellary.** **Type :- 'M'.**

Object :—Type $A_2$ : To study the response curves of important cereal, cash and oilseed crops to Phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red sandy. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS ;

8 manurial treatments :
O =Control (no manure).
$N_1$ =15 Kg/ha. of N.
$P_1$ =30 Kg/ha. of $P_2O_5$.
$P_2$ =60 Kg/ha. of $P_2O_5$.
$N_1P_1$ =15 Kg/ha. of N+30 Kg/ha. of $P_2O_5$.
$N_1P_2$ =15 Kg/ha. of N+60 Kg/ha. of $P_2O_5$.
$N_2P_2$ =30 Kg/ha. of N+60 Kg/ha. of $P_2O_5$.
$N_2P_2K_2$=30 Kg/ha. of N+60 Kg/ha. of $P_2O_5$+60 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN:

Same as in type $A_1$ (*Rabi* Irrigated) on page 494.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1962 to 1966 [1963 to 1965 N.A.] for Mysore ; and 1965 to 1966 for Bellary. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

Mysore
62(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 14 | 20 | 44 | 100 | 38 | 224 | 336 | 13·9 |

Control yield=552 Kg/ha. ; No. of trials=2.

Bellary
65(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 383 | 596 | 617 | 624 | 685 | 840 | 932 | 85·4 |

Control yield=1270 Kg/ha. ; No. of trials=2.

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**Crop :- Groundnut (*Rabi*).** **Ref :- Ms. 64, 65 (S.F.T.).**

**Site :- (District) : N. Kanara.** **Type :. 'M'.**

Object :—Type $A_2$ : To study the response curves of important cereal, cash and oilseed crops to Phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Laterite. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS : and 3. DESIGN :

Same as in Type $A_2$ (*Rabi* Irrigated) on page 497.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1964 to 1966 (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 284 | 252 | 331 | 379 | 451 | 581 | 773 | 33·1 |

Control yield=1329 Kg/ha. ; No. of trials=7.

65(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 112 | 141 | 363 | 600 | 722 | 921 | 911 | 57·2 |

Control yield=2024 Kg/ha. ; No. of trials=5.

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**Crop :- Groundnut (*Kharif*).** **Ref :- Ms. 65 (S.F.T.).**

**Site :- (District) : Bellary.** **Type :- 'M'.**

Object :—Type $A_2$ : To study the response curves of important cereal, cash and oilseed crops to Phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red sandy. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in Type $A_1$ (*Rabi* Irrigated) on page 497.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1965 only. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | −85 | 24 | 19 | 143 | 125 | 117 | 196 | 106·7 |

Control yield=530 Kg/ha. ; No. of trials=2.

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**Crop :- Groundnut** (*Kharif*). **Ref :- Ms. 64 (S.F.T.) for Bellary and Mandya; 64,65 (S.F.T.) for others.**

**Site :- (District) : Bangalore, Belgaum, Bellary, Mandya and Mysore.** **Type :- 'M'.**

Object :— Type $A_2$ : To study the response curves of important cereal, cash and oilseed crops to Phosphorus applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Deep black for Belgaum, Red loamy for Bangalore, Red sandy for others.(iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :
O =Control (no manure).
$N_1$ =15 Kg/ha. of N.
$P_1$ =20 Kg/ha. of $P_2O_5$.
$P_2$ =40 Kg/ha. of $P_2O_5$.
$N_1P_1$ =15 Kg/ha. of N+20 Kg/ha. of $P_2O_5$.
$N_1P_2$ =15 Kg/ha. of N+40 Kg/ha. of $P_2O_5$.
$N_2P_2$ =30 Kg/ha. of N+40 Kg/ha. of $P_2O_5$.
$N_2P_2K_2$=30 Kg/ha. of N+40 Kg/ha. of $P_2O_5$+40 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in Type $A_1$ (*Rabi*) on page 494.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1964 to 1966 for Banglore and Belgaum ; 1964 to 1965 for Mysore and 1964 only for others. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

**Belgaum**

64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 156 | 210 | 349 | 398 | 378 | 705 | 759 | 38·7 |

Control yield=1097 Kg/ha. ; No. of trials=4.

65(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 145 | 92 | 151 | 260 | 150 | 417 | 420 | 76·3 |

Control yield=1205 Kg/ha. ; No. of trials=3.

**Bangalore**

64(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 153 | 174 | 291 | 216 | 374 | 318 | 493 | 24·3 |

Control yield=1525 Kg/ha. ; No. of trials=3.

65(S.F.T.)

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 204 | 224 | 224 | 284 | 470 | 574 | 549 | 66·3 |

Control yield=1526 Kg/ha. ; No. of trials=2.

**Mandya**

**64(S.F.T.)**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 148 | 98 | 98 | 345 | 345 | 345 | 741 | 146·7 |

Control yield=988 Kg/ha. ; No. of trials=2.

**Mysore**

**64(S.F.T.)**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 917 | 1181 | 1189 | 1209 | 1646 | 1720 | 2000 | 287·9 |

Control yield=2353 Kg/ha.; No. of trials=2.

**65(S.F.T.)**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 322 | 469 | 544 | 551 | 689 | 872 | 981 | 61·1 |

Control yield=661 Kg/ha. ; No. of trials=2.

**Bellary**

**64(S.F.T.)**

| Treatment | $N_1$ | $P_1$ | $P_2$ | $N_1P_1$ | $N_1P_2$ | $N_2P_2$ | $N_2P_2K_2$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 238 | 338 | 414 | 414 | 477 | 537 | 590 | 46·6 |

Control yield=750 Kg/ha. ; No. of trials=4.

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**Crop :- Groundnut (*Rabi*).** **Ref :- Ms. 65 (S.F.T.) for Bellary and 62 (S.F.T.) for Mysore.**

**Site :- (District) : Bellary and Mysore.** **Type :- 'M'.**

Object :—Type $A_2$ : To study the response curves of important cereal, cash and oilseed crops to Potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Red sandy. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manurial treatments :
O =Control (no manure).
$N_1$ =15 Kg/ha. of N.
$K_1$ =30 Kg/ha. of $K_2O$.
$K_2$ =60 Kg/ha. of $K_2O$.
$N_1K_1$ =15 Kg/ha. of N+30 Kg/ha. of $K_2O$.
$N_1K_2$ =15 Kg/ha. of N+60 Kg/ha. of $K_2O$.
$N_2K_2$ =30 Kg/ha. of N+60 Kg/ha. of $K_2O$.
$N_1P_1K_1$ =15 Kg/ha. of N+30 Kg/ha. of $P_2O_5$+30 Kg/ha. of $K_2O$.
N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. Pot.

3. DESIGN :

Same as in Type $A_1$ (*Rabi*, Irrigated) on page 494.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1965 to 1966 for Bellary and 1962 to 1966 [1963 to 1965 N.A.] for Mysore. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

**Bellary**

65(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 268 | 222 | 342 | 1572 | 674 | 905 | 917 | 522·6 |

Control yield=1109 Kg/ha.; No. of trials=2.

62(S.F.T.)

**Mysore**

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 21 | 24 | 25 | 47 | 65 | 233 | 267 | 6·7 |

Control yield=549 Kg/ha. ; No. of trials=2.

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**Crop :- Groundnut** (*Rabi*). **Ref :- Ms. 64, 65 (S.F.T.).**

**Site :- (District) : N. Kanara.** **Type :- 'M'.**

Object:—Type $A_2$ : To study the response curves of important cereal, cash and oilseed crops to Potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Laterite. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN:

Same as Type $A_2$ (*Rabi*, Irrigated) on page 500.

4. GENERAL :

(i) to (iii) N.A. (iv) (a) 1964 to 1966. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 120 | 80 | 130 | 300 | 340 | 480 | 480 | 25·0 |

Control yield=1450 Kg/ha. ; No. of trials=8.

65(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 121 | 106 | 156 | 414 | 514 | 857 | 735 | 125·1 |

Control yield= 1952 Kg/ha. ; No. of trials=5.

**Crop :- Groundnut (*Kharif*).**

**Ref :- Ms. 64, 65 (S.F.T.) for Bangalore, Belgaum, Bellary and Mysore.**

**Site :- (District) : Bangalore, Belgaum, Bellary and Mysore.**

**Type :- 'M'.**

Object :—Type $A_3$ : To study the response curves of important cereal, cash and oilseed crops to Potash applied singly and in combination with other nutrients.

1. BASAL CONDITIONS :

(i) N.A. (ii) Deep black for Belgaum ; Red loamy for Bangalore and Red sandy for others. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS and 3. DESIGN :

Same as in Type $A_3$ (*Rabi*, Irrigated) on page 500.

4. GENERAL:

(i) to (iii) N.A. (iv) (a) 1964 to 1966 for Bangalore and Belgaum ; 1964 to 1965 for Bellary and Mysore. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

**Bangalore**

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 292 | 159 | 330 | 317 | 454 | 471 | 534 | 33·8 |

Control yield=1714 Kg/ha. ; No. of trials=3.

65(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 74 | 219 | —246 | 194 | 249 | 319 | 284 | 221·2 |

Control yield=1806 Kg/ha. ; No. of trials=2.

**Belgaum**

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 202 | 110 | 312 | 209 | 342 | 467 | 409 | 39·3 |

Control yield=1130 Kg/ha. ; No. of trials=4.

65 (S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 98 | 139 | 159 | 211 | 185 | 307 | 219 | 46·6 |

Control yield=1276 Kg/ha. ; No. of trials=4.

**Bellary**

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 215 | 107 | 123 | 319 | 296 | 482 | 502 | 46·3 |

Control yield=819 Kg/ha. ; No. of trials=4.

65(S.F.T,)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 51 | 79 | 103 | 171 | 115 | 236 | 139 | 27·3 |

Control yield=952 Kg/ha.; No. of trials=7.

Mysore

64(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $K_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 1154 | 624 | 1053 | 1255 | 1423 | 1069 | 2056 | 387·3 |

Control yield=1849 Kg/ha. ; No. of trials=2.

65(S.F.T.)

| Treatment | $N_1$ | $K_1$ | $F_2$ | $N_1K_1$ | $N_1K_2$ | $N_2K_2$ | $N_1P_1K_1$ | S.E. |
|---|---|---|---|---|---|---|---|---|
| Av. response of pods in Kg/ha. | 298 | 253 | 355 | 445 | 507 | 622 | 716 | 100·1 |

Control yield=700 Kg/ha. ; No. of trials=2.

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**Crop :- Groundnut** (*Kharif*). **Ref :- Ms. 63(66), 64(100).**

**Site :- Agri College Farm, Dharwar.** **Type :- 'C'.**

Object :—To find out suitable spacing between rows and between plants in the rows for erect type of Groundnut.

1. BASAL CONDITIONS :

(i) (a) N.A. for 63(66) ; Cotton and Chilli—Groundnut for 64(100). (b) N.A. for 63(66) : cotton and chilli for 64(100). (c) N.A. (ii) Black for 63(66) : Medium black for 64(100). (iii) 9.7.1963 ; 29.6.1964. (iv) (a) 2 to 3 harrowings. (b) Dibbling. (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) Spanish improved (early). (vii) Unirrigated. (viii) 2 hand weedings and 1 intercultivation. (ix) N.A. for 63(66), 76 cm. for 64(100). (x) 12.10.63 ; 7.10.64.

2. TREATMENTS :

**Main-plot treatments :**

4 spacings between rows : $R_1=23$, $R_2=30$, $R_3=38$ and $R_4=46$ cm.

**Sub-plot treatments :**

4 plant spacings : $P_1=8$, $P_2=15$, $P_3=23$ and $P_4=30$ cm.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 4 sub-plots/main-plot. (b) 36·6 m.×29·3 m. for 63(66), N.A. for 64(100). (iii) 4. (iv) (a) 9·1 m.×7·3 m. for 63(66) ; 8·7 m.×6·7 m. for 64(100). (b) 8·2 m.×6·9 m. for 63(66) ; 8·7 m.×6·7 m. for 64(100). (v) 45 cm.×24 cm. for 63(66), Nil for 64(100). (vi) Yes.

4. GENERAL :

(i) Fair except 63(66) replication II. (ii) Tikka for 63(66), Nil for 64(100). (iii) Yield of pods. (iv) (a) 1963 to 64. (b) No. (c) As under 5. results. (v) and (vi) Nil. (vii) Both the error variances are homogeneous. Main-plot treatments×years and sub-plot treatments×years interactions are present.

5. RESULTS:

(i) 1449 Kg/ha. (ii) (a) 200·9 Kg/ha. (based on 3 d.f. made up of treatments×years interaction, (b) 258·6 Kg/ha. (based on 12 d.f. made up of treatments×year interactions). (iii) Main effects of R and P are significant. (iv) Av. yield of pods in Kg/ha.

| | $R_1$ | $R_2$ | $R_3$ | $R_4$ | Mean |
|---|---|---|---|---|---|
| $P_1$ | 2049 | 1527 | 1348 | 1320 | 1561 |
| $P_2$ | 1989 | 1769 | 1395 | 1425 | 1645 |
| $P_3$ | 1789 | 1477 | 1280 | 1063 | 1402 |
| $P_4$ | 1477 | 1086 | 1065 | 1115 | 1186 |
| Mean | 1826 | 1465 | 1272 | 1231 | 1449 |

C.D. for R marginal means=319·5 Kg/ha.
C.D. for P marginal means=281·7 Kg/ha.

| Years | $R_1$ | $R_2$ | $R_3$ | $R_4$ | Sig. | S.E./Main plot | $P_1$ | $P_2$ | $P_3$ | $P_4$ | Sig. | G.M. | S.E./Sub-plot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1963 | 2066 | 1640 | 1400 | 1304 | ** | 445·1 | 1531 | 1906 | 1672 | 1302 | ** | 1603 | 330·8 |
| 1964 | 1585 | 1289 | 1144 | 1157 | ** | 253·4 | 1591 | 1383 | 1132 | 1069 | ** | 1294 | 299·2 |
| Pooled | 1826 | 1465 | 1272 | 1231 | ** | 200·9 | 1561 | 1645 | 1402 | 1186 | ** | 1449 | 258·6 |

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**Crop :- Groundnut (*Kharif*).** **Ref :- Ms. 64(44).**

**Site :- Agri. College Farm, Dharwar.** **Type :- 'C'.**

Object:—To find out suitable tillage practices for the cultivation of erect type of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Cotton Chilli—Groundnut. (b) Cotton. (c) N.A. (ii) Medium black. (iii) 6.7.1964. (iv) (a) As per treatments. (b) Dibbling. (c) to (e) N.A. (v) Nil. (vi) Spanish improved (early). (vii) Unirrigated. (viii) 2 hand weedings and 2 interculturings. (ix) 70 cm. (x) 27.10.64.

2. TREATMENTS:

4 cultural treatments : $T_1$=Ploughing with mould board plough to a depth of 20 cm. followed by 4 harrowings. $T_2$=Ploughing with mould board plough to a depth of 15 cm. followed by 4 harrowings, $T_3$=Ploughing with indigenous wooden plough followed by 4 harrowings and $T_4$=4 harrowings only.

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 9·1 m.×7·3 m. (b) 8·5 m.×6·7 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL:

(i) Fair. (ii) Nil. (iii) No. of developed and undeveloped pods and yield of pods. (iv) (a) 1964 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 871 Kg/ha. (ii) 113·7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 888 | 799 | 887 | 909 |

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**Crop :- Groundnut (*Kharif*).** **Ref :- Ms. 64(43).**

**Site :- Agri. College Farm, Dharwar.** **Type :- 'C'.**

Object :—To find out suitable tillage practices for the cultivation of erect type of Groundnut in light red soil.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) Light red soil. (iii) 6.7.64. (iv) (a) As per treatments. (b) Dibbling. (c) to (e) N.A. (v) Nil. (vi) Spanish improved (early). (vii) Unirrigated. (viii) 2 hand weedings and 2 interculturings. (ix) 70 cm. (x) 27.10 64.

2. TREATMENTS : to 4. GENERAL :

Same as in expt. no 64(44) on page 504.

5. RESULTS :

(i) 966 Kg/ha. (ii) 162·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 942 | 1040 | 955 | 928 |

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**Crop :- Groundnut (*Kharif*)** **Ref :- Ms. 63(55).**

**Site :- Agri. Res. Stn., Gangavati.** **Type :- 'C'.**

Object :—To find suitable time of sowing for Groundnut under irrigated conditions.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Groundnut. (b) *Jowar*. (c) 12 4 C.L./ha. of F.Y.M. (ii) Black. (iii) As per treatments. (iv) (a) Ploughing with iron plough to a depth of 15 cm. (b) Dibbling. (c) to (e) N.A. (v) Nil. (vi) TMV—2 (early). (vii) Irrigated. (viii) 2 hand weedings, interculturing. (ix) N.A. (x) depending upon the dates of sowing.

2. TREATMENTS :

4 dates of sowing : $T_1$=2nd fortnight of May, $T_2$=1st fortnight of June, $T_3$=2nd fortnight of June and $T_4$= 1st fortnight of July, 1963.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 18·3 m.×12·2 m. (iii) 6. (iv) (a) 9·1 m.×6·1 m. (b) 8·5 m.×5·5 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Medium. (ii) N.A. (iii) Yield of pods. (iv) (a) 1963—N A. (b) No. (c) Nil. (v) and (vi) Nil. (vii) This expt. was conducted by Asstt. Agronomist, Groundnut Scheme, Agri. College, Dharwar.

5. RESULTS :

(i) 895 Kg/ha. (ii) 265·5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 1463 | 1014 | 947 | 157 |

C.D.=326·7 Kg/ha.

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**Crop :- Groundnut** (*Summer*). **Ref :- Ms. 64(54).**

**Site :- Agri. Res. Stn., Gangavati.** **Type :- 'C'.**

Object :—To find out suitable time of sowing for cultivation of irrigated Groundnut.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Groundnut. (b) *Jowar*. (c) Nil. (ii) Medium black and alkaline soil. (iii) As per treatments. (iv) (a) Tractor ploughing once and wooden ploughing once. (b) to (e) N.A. (v) 11·2 Kg/ha. of N as A/S and 16·8 Kg/ha. of $P_2O_5$ as Super applied with the help of the drill. (vi) TMV—2 (Medium). (vii) Irrigated. (viii) 2 hand weedings. (ix) and (x) N.A.

2. TREATMENTS :

4 times of sowing : $T_1$=2nd fortnight of January. $T_2$=1st fortnight of February. $T_3$=2nd fortnight of February. and $T_4$=1st fortnight of March, 1964.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 6·4 m.×6·4 m. (b) 6·1 m.×6·1 m. (v) 15 cm.×15 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Attack of aphids—No control measures taken. (iii) Yield of pods. (iv) (a) 1963—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 500 Kg/ha. (ii) 142·4 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 361 | 786 | 406 | 448. |

C.D.=175·1 Kg/ha.

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**Crop :- Groundnut.** **Res :- Ms. 64(51).**

**Site :- Agri. Res. Stn., Gangavati.** **Type :- 'C'.**

Object :—To find suitable time of sowing for irrigated Groundnut.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Groundnut. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M. (ii) Slightly alkaline clay with calcium pebbles. (iii) As per treatments. (iv) (a) Ploughing and harrowing. (b) Dibbling (c) to (e) N.A. (v) Nil. (iv) TMV – 2 (early). (vii) Irrigated. (viii) Hand weeding and 2 interculturings. (ix) N.A. (x) 15.5.64 to 17.7.64.

2. TREATMENTS :

4 dates of sowing : $T_1$=1st fortnight of Feb., $T_2$=2nd fortnight of Feb., $T_3$=1st fortnight of March.. and $T_4$=2nd fortnight of March, 1964.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 18·3 m.×12·2 m. (iii) 4. (iv) (a) 9·1 m.×6·1 m. (b) 8·5 m.×5.5 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Attack of aphids. Endrine was sprayed twice (iii) No of developed and undeveloped seeds and yield of pods. (iv) (a) 1964—N.A. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) This expt. was conducted by Asstt. Agronomist, (Groundnut Scheme) Agri. College, Dharwar.

5. RESULTS :

(i) 1807 Kg/ha. (ii) 331·1 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 2271 | 2050 | 1662 | 1246 |

C.D.=432·5 Kg/ha.

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**Crop :- Groundnut (*Summer*).** **Ref :- Ms. 64(50).**

**Site :- Agri. Res. Stn., Gangavati.** **Type :- 'C'.**

Object :—To find a suitable row and plant spacing for erect type of irrigated Groundnut.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Groundnut. (b) Groundnut. (c) 12·4 C.L./ha. of F.Y.M. (ii) Slightly alkaline clay with calcium pebbles. (iii) 4.2.64. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) TMV—2 (early). (vii) Irrigated. (viii) 2 hand weedings and interculturings. (ix) N.A. (x) 6.6.64.

2. TREATMENTS :

Same as in expt. no 63(66), 64(100) at Dharwar on page 503.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 9·1 m.× 7·3 m. (b) 8·7 m.×6·7 m. (v) 22 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Attack of aphids and leaf minor. Endrine was sprayd as control measure. (iii) No. of developed and undeveloped seeds and yield of pods. (iv) (a) 1964 only. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 948 Kg/ha. (ii) (a) 234·8 Kg/ha. (b) 226·1 Kg/ha. (iii) Main effects of R and P are highly significant. (iv) Av. yield of pods in Kg/ha.

| | $P_1$ | $P_2$ | $P_3$ | $P_4$ | Mean |
|---|---|---|---|---|---|
| $R_1$ | 1515 | 1193 | 996 | 850 | 1138 |
| $R_2$ | 1494 | 1142 | 811 | 824 | 1068 |
| $R_3$ | 1176 | 850 | 682 | 554 | 816 |
| $R_4$ | 1056 | 738 | 661 | 626 | 770 |
| Mean | 1310 | 981 | 788 | 714 | 948 |

C.D. for R marginal means=187·7 Kg/ha.
C·D. for P marginal means=162·3 Kg/ha.

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**Crop :-Groundnut** (*Kharif*). **Ref : Ms. 62(46).**

**Site :- Agri. College, Hebbal.** **Type :- 'C'.**

Object :— To find out the optimum numbers of intercultivation to encourage greater pod formation in Groundnut.

1. BASAL CONDITIONS:

(i) (a) *Ragi* after *Ragi*. (b) *Ragi*. (c) Nil. (ii) Red loamy soil. (iii) N.A. (iv) (a) 2 ploughings with Mysore B.P. pough, passing Halube. (b) Drilled. (c) 90 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) 7·5 C.L./ha. of compost+125 Kg/ha. of $P_2O_5$ As Super+62·5 Kg/ha. of N as A/S. (vi) H.G. 10 (early). (vii) Unirrigated. (viii) As per treatments. (ix) 67 cm. (x) 27.11.62.

2. TREATMENTS :

4 intercultivation treatments : $T_1$=Once in 5 days, $T_2$=Once in 10 days, $T_3$=Once in 15 days and $T_4$= Once in 20 days.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) 15·2 m.×6·7 m. (b) 14·6 m.×6·1 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Tikka disease. No control measures taken. (iii) Pods yield. (iv (a) 1962 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 749 Kg/ha. (ii) 226·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yied of pods in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 832 | 787 | 700 | 675 |

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**Crop :- Groundnut** (*Kharif*). **Ref : Ms. 61(88), 62(93), 63(93).**

**Site :- Agri. Res. Stn., Saundatti.** **Type :- 'C'.**

Object :— To study the effect of double cropping in relation to the yield of suceeding crop of *Jowar* in dry tract.

1. BASAL CONDITIONS :

(i) (a) As per treatments. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M.+33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ (ii) Medium black. (iii) 9.6.61 ; 10.6.62 ; 28.6.63. (iv) (a) 2 to 3 harrowings. (b) Drilling. (c) 90 Kg/ha. (d) 30 cm.×15 cm. (e) —. (v) 22·4 Kg/ha. of $P_2O_5$ as Super applied by means of continued seed drill at the time of sowing. (vi) Spanish improved. (vii) Unirrigated. (viii) Interculturing with hoe. (ix) 23 cm. ; 47 cm. ; 30 cm. (x) 21.9.61 ; 2.10.62. ; 14.10.63.

2. TREATMENTS :

5 previous crops : $T_0$=Fallow, $T_1$=Wheat, $T_2$=Gram, $T_3$=*Rabi Jowar* and $T_4$=Cotton.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 13·7 m.×32·0 m. (iii) 4. (iv) (a) 13·7 m.×6·4 m. (b) 11·9 m.×4·6 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of pods. (iv) (a) 1961 to 1963. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and treatments×years interaction is absent.

5. RESULTS :

**61(88)**

(i) 2258 Kg/ha. (ii) 261·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. yield | 2225 | 2246 | 2312 | 2208 | 2286 |

**62(93)**

(i) 1989 Kg/ha. (ii) 181·6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. yield | 2096 | 2050 | 1946 | 2056 | 1798 |

**63(92)**

(i) 535 Kg/ha. (ii) 47·8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. yield | 540 | 532 | 504 | 524 | 575 |

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**Crop :- Groundnut** (*Kharif*). **Ref. :- Ms. 64(38).**

**Site :- Bailhongal (Belgaum, *c.f.*).** **Type :- 'C'.**

Object :— To find out suitable tillage practices for cultivation of erect type of Groundnut.

1. BASAL CONDITIONS.

(i) (a) N.A. (b) *Jowar*. (c) N.A. (ii) Medium black. (iii) N.A. (iv) Spanish improved. (v) (a) As per treatments. (b) to (e) N.A. (vi) 1.7.1964. (vii) Unirrigated. (viii) 1 hand weeding. (ix) N.A. (x) 25.10.1964.

2. TREATMENTS :

4 cultural treatments : $T_1$=Ploughing with mould board plough to a depth of 20 cm. followed by 4 harrowings, $T_2$=Ploughing with mould board plough to a depth of 15 cm. followed by 4 harrowings, $T_3$=Ploughing with indigenous wooden plough followed by 4 harrowings and $T_4$=4 harrowings only.

3. DESIGN :

(i) R.B.D. with 4 plots/block and 6 replications. (ii) N.A. (iii) (a) 7·3 m.×12·2 m. (b) 6·7 m.×11·0 m. (iv) Yes

4. GENERAL :

(i) Due to heavy rains, there was stunted growth. (ii) Nil. (iii) Yield of pods. (iv) (a) 63-N.A. (b) N.A. (c) Nil. (v) Nil. (vi) Nil. (vii) Experiment was conducted by Asstt. Agronomist, Groundnut Scheme, Agri. College Dharwar. Experiments conducted during 1963 and 1965 N.A.

5. RESULTS :

(i) 132 Kg/ha. (ii) 25·6 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 147 | 122 | 156 | 104 |

C.D.=31·4 Kg/ha.

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**Crop :- Groundnut (*Kharif*).** **Ref :- Ms. 64(39).**

**Site :- Bailhongal (Belgaum, *c.f.*).** **Type :- 'C'.**

Object :— To find out suitable spacing for erect type of Groundnut.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Jowar*. (c) N.A. (ii) Medium black. (iii) N.A. (iv) Spanish improved (early). (v) (a) 2 ploughings with wooden plough and harrowing. (b) and (c) N.A. (d) As per treatments. (e) Nil. (vi) 1.7.64. (vii) Unirrigated. (viii) and (ix) N.A. (x) 25.10.64.

2. TREATMENTS :

4 spacings: $S_1$=23 cm.×6 cm., $S_2$= 30 cm.×6 cm., $S_3$=38 cm.×6cm. and $S_4$=46 cm.×6 cm.

3. DESIGN :

(i) R.B.D. with 4 plots/block and 4 replications. (ii) N.A. (iii) (a) N.A. (b) 6·7 m.×9·1 m. (iv) Yes.

4. GENERAL :

(i) Due to heavy rains, the growth was stunted. (ii) Nil. (iii) Yield of pods. (iv) (a) 64-N.A. (b) No. (c) Nil. (v) Koppal (Raichur). (vi) Nil. (vii) Experiment was conducted by Asstt. Agronomist, Groundnut scheme, Agri. College, Dharwar. Experiments conducted during 1963 and 65 N.A.

5. RESULTS :

(i) 133 Kg/ha. (ii) 24·3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $S_1$ | $S_2$ | $S_3$ | $S_4$ |
|---|---|---|---|---|
| Av. yield | 155 | 137 | 113 | 128 |

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**Crop :- Groundnut (*Kharif*).** **Ref :- Ms. 63(74), 63(71).**

**Site :- Hangerki, Harabelawadi (Dharwar, *c.f.*).** **Type :- 'C'.**

Object :—To find out optimum seed rate for erect type of Groundnut.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Black. (iii) 11·2 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$. (iv) Spanish improved. (v) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (vi) 14.7.63, 12.7.63 ; (vii) Unirrigated. (viii) 2 to 3 interculturings and 1 hand weeding. (ix) N.A. (x) 15.10.63 ; 14.10.63.

2. TREATMENTS :

5 seed rates : $R_1$=45, $R_2$=67, $R_3$=89, $R_4$=112 and $R_5$=134 Kg/ha.

3. DESIGN :

(i) R.B D. with 5 plots/block, 4 replications. (ii) N.A. (iii) (a) 22·0 m.×9·1 m. (b) 21·3 m.×8·5 m. (iv) N.A.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of pods. (iv) (a) 1963 to 65 (Expts. for 64 and 65 N.A). (b) N.A. (c) As under 5. Results. (v) and (vi) N.A. (vii) Error variances are heterogeneous. Treatments×years interaction is absent.

5. RESULTS :

63(64) (At Hangerki)

(i) 507 Kg/ha. (ii) 55·6 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $R_1$ | $R_2$ | $R_3$ | $R_4$ | $R_5$ |
|---|---|---|---|---|---|
| Av. yield | 437 | 553 | 573 | 495 | 475 |

C.D.=85·7 Kg/ha.

63(71) (At Harabelawadi)

(i) 483 Kg/ha. (ii) 27·7 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $R_1$ | $R_2$ | $R_3$ | $R_4$ | $R_5$ |
|---|---|---|---|---|---|
| Av. yield | 436 | 548 | 548 | 461 | 423 |

C.D.=42·6 Kg/ha.

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**Crop :- Groundnut** (*Kharif*). **Ref :- Ms. 63(73), 63(70).**

**Site :- Hangerki, Harabalawadi, (Dharwar,** *c.f.*). **Type :- 'C'.**

Object :—To find out suitable spacing for erect type of Groundnut.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Black. (iii) 11·2 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ applied before sowing. (iv) Spanish improved. (v) (a) to (c) N.A. (d) As per treatments. (e) N.A. (vi) 10.7.63 ; 10.7.63. (vii) Unirrigated. (viii) 2 interculturings and 1 weeding. (ix) N.A. (x) 18.10.63 ; 15.10.63.

2. TREATMENTS :

4 spacing between rows : $S_1$=23, $S_2$=30, $S_3$=38 and $S_4$=46 cm.

3. DESIGN :

(i) R.B.D. with 4 plots/block and 4 replications. (ii) N.A. (iii) (a) 22·0 m.×9·1 m. (b) 21·0 m.×8·7 m. ; 21·3 m.×8·5 m. (iv) N.A.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of pods. (iv) (a) 1963 to 65. (Expts. for 64 and 65 N.A.). (b) N.A. (c) As under 5. Results. (v) Distt. Belgaum 64(39). (vi) N.A.(vii) Error variances are homogeneous. Treatments × years interaction is absent.

5. RESULTS :

(i) 453 Kg/ha. (ii) 31·9 Kg/ha. (based on 21 d.f. made up of pooled error and treatments × years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $S_1$ | $S_2$ | $S_3$ | $S_4$ |
|---|---|---|---|---|
| Av. yield | 475 | 492 | 431 | 413 |

C.D.=33·8 Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Sig. | G.M. | S.E./plot. |
|---|---|---|---|---|---|---|---|
| 1963 (73) | 484 | 497 | 431 | 416 | N.S. | 457 | 42·2 |
| 1963 (70) | 465 | 486 | 431 | 410 | ** | 448 | 23·5 |
| Pooled | 475 | 492 | 431 | 413 | ** | 553 | 31·9 |

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**Crop :- Groundnut** (*Kharif*). **Ref :- Ms. 64(46).**

**Site :- Ginigera (Raichur,** *c.f.*). **Type :- 'C'.**

Object :—To find out optimum seed rate for spreading type of Groundnut.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M. (ii) Medium red. (iii) Nil. (iv) P. No. 8. (v) (a) Ploughing with wooden plough and harrowing. (b) Dibbling. (c) As per treatments. (d) and (e) N.A. (vi) 28.6.1964. (vii) Unirrigated. (viii) and (ix) N.A. (x) 17.11.64.

2. TREATMENTS :

5 seed rates : $R_1$=17, $R_2$=34, $R_3$=50, $R_4$=67 and $R_5$=84 Kg/ha.

3. DESIGN .

(i) R.B.D. with 5 plots/block and 4 replications. (ii) N.A. (iii) (a) 9·1 m.×6·1 m. (b) 8·7 m.×5·5 m. (iv) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of pods. (iv) (a) 1963-65 (Expt. for 63 and 65 N.A. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Experiment conducted by Asstt. Agronomist, Groundnut scheme, Agri. College, Dharwar.

5. RESULTS :

(i) 1647 Kg/ha. (ii) 170·3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $R_1$ | $R_2$ | $R_3$ | $R_4$ | $R_5$ |
|---|---|---|---|---|---|
| Av. yield | 1571 | 1674 | 1794 | 1598 | 1598 |

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**Crop :- Groundnut** (*Kharif*). **Ref :- Ms. 64(47).**

**Site :- Koppal (Raichur,** *c.f.*). **Type :- 'C'.**

Object :—To find out suitable spacing for spreading type of Groundnut.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M. (ii) Red. (iii) 12·4 C.L./ha. of F.Y.M. (iv) P. No. 8. (v) (a) Ploughing with wooden plough and harrowing. (b) Dibbling. (c) N.A. (d) As per treatments. (e) N.A. (vi) 26.8.64. (vii) Unirrigated. (viii) and (ix) N.A. (x) 16.11.64.

2. TREATMENTS :

5 spacings : $S_1$=30 cm.×6 cm., $S_2$=38 cm ×6 cm., $S_3$=46 cm.×6 cm., $S_4$=53 cm.×6 cm. and $S_5$= 61 cm.×6 cm.

3. DESIGN:

(i) R.B.D. with 5 plots/block and 4 replications. (ii) N.A. (iii) 9·8 m.×7·3 m. to 10·4 m.×7·3 m. (b) 9·1 m.×6·7 m. (iv) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of pods. (iv) 1963-'65 (Expt. for 1963 and '65 N.A.) (b) No. (c) Nil. (v) Bailhongal (Belgaum). (vi) Nil. (vii) Experiment conducted by Asstt. Agronomist, Groundnut scheme, Agri. College, Dharwar.

5. RESULTS :

(i) 1213 Kg/ha. (ii) 102·5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ |
|---|---|---|---|---|---|
| Av. yield | 1199 | 1407 | 1415 | 1109 | 938 |

C.D.=157·9 Kg/ha.

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**Crop :- Groundnut** (*Kharif*). **Ref :- Ms. 60(112), 61(86), 62(85), 63(85), 64(59).**

**Site :- Agri. Res. Stn., Saundatti.** **Type :- 'CV'.**

Object :—To find out a suitable variety with proper spacing and seed rate.

1. BASAL CONDITIONS :

(i) (a) *Jawar*—Groundnut. (b) Groundnut for 60(112), *Jowar* for others. (c) Nil. (ii) Medium black. (iii) 5.7.60 ; 12.6.61 ; 29.6.62, 28.6.63 ; 2.7.64. (iv) (a) 3 harrowings for 60(112), 61(86), 64(59) and 2 harrowings for others. (b) N.A. for 60(112) ; drilling for others. (c) and (d) As per treatments. (e) N.A. (v) 22·4 Kg/ha. of $P_2O_5$ as Super at the time of sowing. (vi) As per treatments. (vii) Unirrigated. (viii) 2 interculturings and 2 hand weedings for 60(112), 61(85), 64(59) ; 3 interculturings and 2 hand weedings for others. (ix) 44 cm. ; 25 cm. ; 51 cm. ; 21 cm. ; 55 cm. (x) 2.11.60 ; 21.9..61 ; 18.10.62 ; 15.10.63 ; 22.10.64.

2. TREATMENTS :

**Main-plot treatments :**

2 varieties : $V_1$=local and $V_2$=Spanish improved.

**Sub-plot treatments :**

3 spacings : $S_1$=30. $S_2$=38 and $S_3$=46 cm.

**Sub-sub-plot treatments :**

3 seed rates : $R_1$=45, $R_2$=67 and $R_3$=89 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 3 sub-plots/main-plot ; 3 sub-sub-plots/sub-plot. (b) 44·8 m.×33·4 m. (iii) 3. (iv) (a) 7·3 m.×11·0 m. for 60(112) ; 7·3 m.×11·0 m. for $S_1$ and $S_3$, 7·3 m.×11·4 m. for $S_2$ for other years. (b) 5·5 m.×9·1 m. for all. (v) 91 cm.×91 cm. for 60(112) ; 91 cm.×91 cm. for $S_1$ and $S_3$, 91 cm.×114 cm. for $S_2$, for others. (vi) Yes.

4. GENERAL :

(i) Unsatisfactory for 60(112) ; satisfactory for 62(85) ; fairly satisfactory for others. (ii) Nil for 63(85) ; attack of grass hoppers. 10% B.H.C. dusted for others. (iii) Yield of pods. (iv) (a) 1960 to 64. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Sub-sub-plot error variances are heterogeneous.

5. RESULTS :

**60(112)**

(i) 360 Kg/ha. (ii) (a) 11·1 Kg/ha. (b) 50·6 Kg/ha. (c) 27·6 Kg/ha. (iii) Main effect of V, S, R and interaction V×R are highly significant. (iv) Av. yield of pods in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $R_1$ | $R_2$ | $R_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $V_1$ | 351 | 324 | 326 | 315 | 343 | 343 | 334 |
| $V_2$ | 424 | 401 | 331 | 336 | 391 | 429 | 385 |
| Mean | 387 | 362 | 329 | 326 | 367 | 386 | 360 |
| $R_1$ | 354 | 332 | 291 | | | | |
| $R_2$ | 396 | 370 | 334 | | | | |
| $R_3$ | 412 | 385 | 362 | | | | |

C.D. for V marginal means=13·0 Kg/ha.

C.D. for S marginal means=38·9 Kg/ha.

C.D. for R marginal means=19·0 Kg/ha.

C.D. for R means at the same level of V=26·8 Kg/ha.

C.D. for V means at the same level of R=24·6 Kg/ha.

**61(86)**

(i) 654 Kg/ha. (ii) (a) 18·1 Kg/ha. (b) 68·9 Kg/ha. (c) 51·9 Kg/ha. (iii) Main effects of V and R are highly significant. (iv) Av. yield of pods in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $R_1$ | $R_2$ | $R_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $V_1$ | 631 | 558 | 513 | 446 | 578 | 677 | 567 |
| $V_2$ | 754 | 721 | 748 | 605 | 760 | 857 | 741 |
| Mean | 693 | 640 | 631 | 526 | 669 | 768 | 654 |
| $R_1$ | 542 | 529 | 506 | | | | |
| $R_2$ | 732 | 622 | 655 | | | | |
| $R_3$ | 805 | 767 | 732 | | | | |

C.D. for V marginal means=21·2 Kg/ha.

C.D. for R marginal means=35·7 Kg/ha.

**62(85)**

(i) 418 Kg/ha. (ii) (a) 47·8 Kg/ha. (b) 49·3 Kg/ha. (c) 36·9 Kg/ha. (iii) Main effects of V and S are highly significant. (iv) Av. yield of pods in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $R_1$ | $R_2$ | $R_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $V_1$ | 397 | 347 | 367 | 297 | 377 | 437 | 370 |
| $V_2$ | 503 | 471 | 422 | 385 | 478 | 533 | 465 |
| Mean | 450 | 409 | 394 | 341 | 427 | 485 | 418 |
| $R_1$ | 382 | 321 | 319 | | | | |
| $R_2$ | 461 | 419 | 402 | | | | |
| $R_3$ | 507 | 486 | 463 | | | | |

C.D. for V marginal means=56·0 Kg/ha.
C.D. for S marginal means=37·9 Kg/ha.

**63(85)**

(i) 428 Kg/ha. (ii) (a) 61·4 Kg/ha. (b) 86·3 Kg/ha. (c) 50·5 Kg/ha. (iii) Main effect of R is highly significant. (iv) Av. yield of pods in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $R_1$ | $R_2$ | $R_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $V_1$ | 447 | 386 | 415 | 330 | 426 | 491 | 416 |
| $V_2$ | 400 | 447 | 476 | 359 | 452 | 512 | 441 |
| Mean | 423 | 417 | 445 | 344 | 439 | 502 | 428 |
| $R_1$ | 316 | 345 | 372 | | | | |
| $R_2$ | 451 | 411 | 455 | | | | |
| $R_3$ | 503 | 494 | 509 | | | | |

C.D. for R marginal means=34·8 Kg/ha.

**64(59)**

(i) 558 Kg/ha. (ii) (a) 24·4 Kg/ha. (b) 62·2 Kg/ha. (c) 44·5 Kg/ha. (iii) Main effect of V is significant, R effect is highly significant. (iv) Av. yield of pods in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $R_1$ | $R_2$ | $R_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $V_1$ | 574 | 584 | 588 | 512 | 591 | 644 | 582 |
| $V_2$ | 534 | 552 | 514 | 465 | 540 | 595 | 533 |
| Mean | 554 | 568 | 551 | 488 | 566 | 620 | 558 |
| $R_1$ | 461 | 510 | 492 | | | | |
| $R_2$ | 559 | 588 | 550 | | | | |
| $R_3$ | 643 | 606 | 610 | | | | |

C.D. for V marginal means=28·6 Kg/ha.
C.D. for R marginal means=30·6 Kg/ha.

**Crop :- Groundnut (*Summer*).** **Ref :- Ms. 64(52).**

**Site :- Agri. Res. Stn., Gangavati.** **Type :- 'I'.**

Object :—To find the optimum no. of irrigation for Groundnut.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—Groundnut. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M. (ii) Slightly alkaline with calcium pebbles. (iii) 3.2.1964. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) to (e) N.A. (v) Nil. (vi) TMV—2 (early). (vii) As per treatments. (viii) 2 hand weedings and 3 interculturings. (ix) N.A. (x) 4.6.1964.

2. TREATMENTS :

4 interval of irrigations : $I_1$=5, $I_2$=9, $I_3$=13 and $I_4$=17 days.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 18·3 m.×12·2 m. (iii) 6. (iv) (a) 9·1 m.×6·1 m. (b) 8·5 m.×5·5 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL .

(i) Good. (ii) Attack of aphids—Sprayed Endrine. (iii) No. of developed and undeveloped seeds and yield of pods. (iv) (a) 1963 to 65. (expt. for 1963 and 65 N.A. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) This expt. was conducted by the Asstt. Agronomist, Groundnut Scheme, Agri. College, Dharwar.

5. RESULTS :

(i) 1022 Kg/ha. (ii) 156·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $I_1$ | $I_2$ | $I_3$ | $I_4$ |
|---|---|---|---|---|
| Av. yield | 1085 | 1068 | 1043 | 893 |

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**Crop :- Groundnut (*Kharif*).** **Ref :- Ms. 61(143), 62(132).**

**Site :- Agri. Res. Stn., Bijapur.** **Type 'D'.**

Object :—To find out the effects of different fungicides on the yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Groundnut—*Jowar*. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M.+11·2 Kg/ha. of N as A/S. (ii) Medium Limy. (iii) 13.7.61 ; 4.7.62. (iv) (a) Ploughing and harrowings. (b) Drilling. (c) 112 Kg/ha.(d) 30 cm. between rows. (e) —. (v) Nil. (vi) Spanish improved. (vii) Unirrigated. (viii) Interculturings and weedings. (ix) 43 cm.; 70 cm. (x) 1.12.61; 12.11.62.

. TREATMENTS:

4 fungicidal seed treatments : $T_0$=Control, $T_1$=Ceresan dry @ 2 gm./Kg. of seed, $T_2$=Ceresan wet @ 2 gm./Kg. of seed and $T_3$=Agroson G.N. @ 2 gm./Kg. of seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 9·1 m.×9·8 m. (iii) 4. (iv) (a) 9·1 m.×2·4 m. (b) 7·9 m.×1·2 m. (v) 61 cm. ×61 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Aphids attack to some extent and slight attack of Tikka. Spraying of Folidol (dilute). (iii) Pod yield. (iv) (a) 1958-62, (modified in 59. 60—N.A.). (b) No. (c) As under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous. Treatments×years interaction is absent. Expt. no. 58(86) taken into account.

5. RESULTS :

(i) 529 Kg/ha, (ii) 61·2 Kg/ha. (based on 45 d.f. made up of pooled error and treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|---|
| Av. yield | 510 | 541 | 521 | 544 |

| Years | $T_0$ | $T_1$ | $T_2$ | $T_3$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|
| 1961 | 475 | 558 | 510 | 538 | N.S. | 520 | 38·3 |
| 1962 | 416 | 500 | 448 | 445 | N.S. | 452 | 73·3 |
| *Pooled | 510 | 541 | 521 | 544 | N.S. | 529 | 61·2 |

*Includes results of Expt. no. 58(86).

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**Crop :- Groundnut (*Kharif*).** **Ref :- Ms. 64(36), 65(94).**

**Site :- Agri. Res. Stn., Siruguppa.** **Type :- 'D'.**

Object :—To find out suitable insecticides that can control the Groundnut leaf minor.

1. BASAL CONDITIONS :

(i) (a) *Tur – Jowar—Tur*—Groundnut ; Cotton—*Jowar*—Groundnut. (b) Tur ; Cowpea. (c) 12·4 tonnes of F.Y.M.+44·8 Kg. of N+22·4 Kg. of $P_2O_5$/ha. (ii) Black cotton. (iii) 13.7.64 ; 25.6.65. (iv) (a) Ploughing and harrowing. (b) Hand dibbling. (c) 49 Kg/ha. ; 90 Kg/ha. (d) 30 cm.×15 cm. ; 30 cm.×10 cm. (e) 2 to 3 ; 1 to 2. (v) 12·4 tonnes of F.Y.M.+44·8 Kg. of $P_2O_5$/ha. ; 12·4 tonnes of F.Y.M.+44·8 Kg. of N+22·4 Kg. of $P_2O_5$/ha. (vi) TMV—2 (medium). (vii) Irrigated. (viii) Weeding and hoeing. (ix) 35 cm ; 27 cm. (x) 9.11.64 ; 5.11.65.

2. TREATMENTS:

8 chemical treatments : $T_0$=Control, $T_1$=D.D.T. 50% w.p., $T_2$=B.H.C. 50% w.p., $T_3$=Parathion 50%, $T_4$=Folidol E.C., $T_5$=Endrine 20 E.C., $T_6$=Sevin 85% Sp.. and $T_7$=Malathion 50%.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 4·3 m.×11·0 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of pods. (iv) (a) 1964 to 65. (b) N.A. (c) As under 5. results. (v) and (vi) Nil. (vii) Error variances are homogeneous and treatments×years interaction is absent.

5. RESULTS :

(i) 845 Kg/ha. (ii) 143·1 Kg/ha. (based on 49 d.f. made up of pooled error and interaction of treatments ×years). (iii) Treatment differences are significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. yield | 646 | 820 | 799 | 936 | 897 | 1030 | 863 | 768 |

C.D.=143·8 Kg/ha.

| Years | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1964 | 538 | 814 | 676 | 810 | 764 | 895 | 777 | 529 | ** | 725 | 114·6 |
| 1965 | 754 | 827 | 923 | 1063 | 1029 | 1166 | 950 | 1006 | N.S. | 965 | 154·0 |
| Pooled | 646 | 820 | 799 | 936 | 897 | 1030 | 863 | 768 | * | 845 | 143·1 |

**Crop :- Groundnut (*Kharif*).** **Ref :- Ms. 64(16).**

**Site :- Reg. Sorghum. Res. Stn., Bailhongal.** **Type :- 'DM'.**

Object :—To investigate the suitability of intercultivation practices on Groundnut under local conditions.

1. BASAL CONDITIONS :

(i) (a) Groundnut. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M. (ii) Blackish Masan. (iii) 2.7.64. (iv) (a) Iron ploughing once, clod crushing and harrowing twice. (b) Dibbling by hand. (c) 37 Kg/ha. (d) 46 cm. × 30 cm. (e) N.A. (v) Nil. (vi) Erect type. (vii) Nil. (viii) 3 interculturings. (ix) 81 cm. (x) 2.10.64.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(1) 2 levels of manuring : $M_0$=Local manuring with F.Y.M. at 12·4 C.L./ha. and $M_1$=Manuring with 11·2 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$.

(2) 2 seed treatments : $S_0$=Untreated and $S_1$=Treated with Agroson G.N.

(3) 2 methods of control of Aphids : $A_0$=No control measure and $A_1$=Dusting by 10% B.H.C.

(4) 2 methods of control of Tikka : $T_0$=No control measure and $T_1$=Dusting with sulphur.

3. DESIGN :

(i) $2^4$ confd. (ii) (a) 8 plots/block ; 2 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 11·0 m.×6·4 m. (b) 9·8 m.×4·6 m. (v) 61 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Good. (iii) Control measures as per treatments. (iii) Height of plant, no. of branches/plant, no. of pods and yield of pods. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1181 Kg/ha. (ii) 95·3 Kg/ha. (iii) Main effect of S is significant. A effect is highly significant. Interactions M×S and M×A are significant. (iv) Mean and differential response table in Kg/ha.

| | Mean response | Differential response | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | M | | S | | A | | T | |
| | | — | + | — | + | — | + | — | + |
| M | —29·2 | — | — | 44·9 | —103·2 | —4·5 | —53·8 | —168·2 | 109·9 |
| S | 85·2 | 159·2 | 11·2 | — | — | 35·9 | 134·5 | 125·6 | 44·9 |
| A | 24·7 | −109·9 | 60·5 | —74·0 | 24·7 | — | — | —76·2 | 26·9 |
| T | 139·0 | 98·7 | 179·4 | 179·4 | 98·7 | 87·5 | 190·6 | | — |

C.D. of mean response=72·5 Kg/ha.
C.D. of differential response=102·7 Kg/ha.

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**Crop :- Castor.** **Ref :- Ms. 60(214), 61(215), 62(216).**

**Site :- Agri. Res. Stn., Mandya.** **Type :- 'M'.**

Object :—To study the effect of N,P and K fertilizers on the yield of Castor.

1. BASAL CONDITIONS :

(i) (a) Cotton—*Jowar*. (b) Cotton. (c) 22·4 Kg/ha. of N+16·8 Kg/ha. of $P_2O_5$+16·8 Kg/ha. of $K_2O$ (ii) Black soil. (iii) 24.5.60 ; 3.7.61. ; 3.7.62. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) 9 Kg/ha. (d) 91 cm.×61. cm. (e) —. (v) 5 C.L./ha. of compost. (vi) Rosy castor. (vii) Unirrigated. (viii) 3 to 4 interculturings. (ix) 29·5 cm. ; 24·8 cm. ; 49·4 cm. (x) 10.12.60 ; N.A. ; 1.2.63.

2. TREATMENTS :

All combinations of (1), (2) and (3).

(1) 3 levels of N : $N_0$=0, $N_1$=16·8 and $N_2$=33·6 Kg/ha.

(2) 3 levels of $P_2O_5$ : $P_0$=0, $P_1$=11·2 and $P_2$=22·4 Kg/ha.

(3) 3 levels of $K_2O$ : $K_0$=0,$K_1$=11·2 and $K_2$=22·4 Kg/ha.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 11·9 m.×11·3 m. (b) 10·1 m.×10·1 m. (v) 91 cm.×62 cm. (vi) yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of castor seed. (iv) (a) 1960–1962. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous and treatments×years interaction is absent.

5. RESULTS :

60(214)

(i) 427 Kg/ha. (ii) 154·8 Kg/ha. (iii) P×K interaction is significant. (iv) Av. yield of castor seed in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 551 | 313 | 463 | 446 | 399 | 482 | 442 |
| $N_1$ | 411 | 536 | 382 | 451 | 452 | 426 | 443 |
| $N_2$ | 358 | 434 | 400 | 363 | 414 | 415 | 397 |
| Mean | 440 | 428 | 415 | 420 | 422 | 441 | 427 |
| $K_0$ | 513 | 340 | 407 | | | | |
| $K_1$ | 329 | 590 | 346 | | | | |
| $K_2$ | 478 | 353 | 492 | | | | |

C.D. for body of P×K table=184·5 Kg/ha.

61(215)

(i) 119 Kg/ha. (ii) 27·9 Kg/ha. (iii) P×K interaction is significant. (iv) Av. yield of castor seed in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 120 | 98 | 119 | 118 | 112 | 107 | 112 |
| $N_1$ | 99 | 96 | 141 | 101 | 109 | 126 | 112 |
| $N_2$ | 129 | 137 | 130 | 140 | 127 | 129 | 132 |
| Mean | 116 | 110 | 130 | 120 | 116 | 121 | 119 |
| $K_0$ | 118 | 126 | 115 | | | | |
| $K_1$ | 103 | 122 | 123 | | | | |
| $K_2$ | 127 | 83 | 152 | | | | |

C.D. for body of P×K table=33·2 Kg/ha.

62(216)

(i) 425 Kg/ha. (ii) 96·0 Kg/ha. (iii) Main effect of N is significant. (iv) Av. yield of castor seed in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 422 | 427 | 426 | 368 | 469 | 438 | 425 |
| $N_1$ | 388 | 476 | 543 | 493 | 416 | 498 | 469 |
| $N_2$ | 418 | 374 | 351 | 373 | 429 | 341 | 381 |
| Mean | 409 | 426 | 440 | 411 | 438 | 426 | 425 |
| $K_0$ | 430 | 432 | 372 | | | | |
| $K_1$ | 417 | 397 | 500 | | | | |
| $K_2$ | 381 | 448 | 448 | | | | |

C.D. for N marginal means=66·0 Kg/ha.

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**Crop :- Grass.** **Ref :- Ms. 60(73), 61(77), 62(75).**

**Site :- Agri. College, Dharwar.** **Type 'M'.**

Object :— To study the fertility requirements of Grass under irrigated conditions.

1. BASAL CONDITIONS :

(i) Grass was sown after maize crop which was manured with 49·4 C.L./ha. of F.Y.M. (ii) Medium black. (iii) N.A. (iv) Hybrid Segregate No. 4 (cross between elephant grass × *Bajra*). (v) Transplanted on 27 to 30.6.61 with 61 cm. × 61 cm. spacing ; N.A. ; N.A. (vi) N.A. (vii) 49·4 C.L./ha. of F.Y.M. in 1960 ; 24·7 C.L./ha. of F.Y.M. in 1961, 62. (viii) 2 weedings and 6 interculturings in 1960 ; 5 interculturings in 1961, 62. (ix) Nil. (x) Irrigated. (xi) 99 cm. ; N.A. ; 87 cm. (xii) 4 cuttings during 1960 ; 3 on 15.9.1961, 27.11.1961 and 9.6.1962 ; 2 on 5.9.1962 and 19.11.1962.

2. TREATMENTS :

**Main-plot treatments :**

5 levels of N as Urea : $N_0$=0, $N_1$=33·6, $N_2$=67·2, $N_3$=100·9 and $N_4$=134·5 Kg/ha.

**Sub-plot treatments :**

3 levels of $P_2O_5$ as Triple Super : $P_0$=0, $P_1$=22·4 and $P_2$=44·8 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6·1 m. × 4·9 m. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of green matter, height spread and number of tillers. (iv) (a) 1960-63 (modified in 1963). (b) N.A. (c) Nil. (v) N.A. (vi) Nil. (vii) Sub-plot error variances are heterogeneous.

5. RESULTS :

60(73)

(i) 466·2 Q/ha. (ii) (a) 86·1 Q/ha. (b) 57·6 Q/ha. (iii) Main effect of N is highly significant and that of P is significant. (iv) Av. yield of grass in Q/ha.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $N_4$ | Mean |
|---|---|---|---|---|---|---|
| $P_0$ | 344·8 | 443·2 | 515·7 | 550·8 | 551·6 | 481·2 |
| $P_1$ | 336·4 | 354·7 | 439·0 | 531·4 | 513·6 | 434·9 |
| $P_2$ | 350·9 | 413·5 | 527·2 | 516·1 | 604·2 | 482·4 |
| Mean | 343·9 | 403·8 | 494·0 | 532·8 | 556·5 | 466·2 |

C D. for N marginal means=76·6 Q/ha.
C.D. for P marginal means=37·2 Q/ha.

**61(77)**

(i) 263·0 Q/ha. (ii) (a) 27·9 Q/ha. (b) 36·9 Q/ha. (iii) Main effects of N and P are highly significant. (iv) Av. yield of grass in Q/ha.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $N_4$ | Mean |
|---|---|---|---|---|---|---|
| $P_0$ | 217·0 | 259·8 | 301·3 | 329·2 | 320·0 | 285·5 |
| $P_1$ | 180·8 | 199·9 | 251·8 | 275·0 | 291·0 | 239·7 |
| $P_2$ | 193·0 | 206·4 | 296·4 | 287·2 | 336·0 | 263·8 |
| Mean | 196·9 | 222·0 | 283·2 | 297·1 | 315·7 | 263·0 |

C.D. for N marginal means=24·8 Q/ha.
C.D. for P marginal means=23·9 Q/ha.

**62(75)**

(i) 115·5 Q/ha. (ii) (a) 19·5 Q/ha. (b) 12·7 Q/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grass in Q/ha.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $N_4$ | Mean |
|---|---|---|---|---|---|---|
| $P_0$ | 83·5 | 104·5 | 110·6 | 132·4 | 127·4 | 111·7 |
| $P_1$ | 89·3 | 96·5 | 117·9 | 132·4 | 142·3 | 115·7 |
| $P_2$ | 90·8 | 106·0 | 131·2 | 129·7 | 138·1 | 119·2 |
| Mean | 87·9 | 102·3 | 119·2 | 131·5 | 135·9 | 115·5 |

C.D. for N marginal means=17·3 Q/ha.

* * *

**Crop :- Grass.** **Ref :- Ms. 63(61).**
**Site :- Agri. College, Dharwar.** **Type :- 'M'.**

Object:— To study the fertility requirements of Grass under irrigated conditions.

1. BASAL CONDITIONS :

(i) N.A. (ii) Light red soil. (iii) N.A. (iv) Hybrid segregate No. 4. (v) 4 to 7.7.1963. (vi) and (vii) N.A. (viii) 7 intercult urings and 4 hand weedings. (ix) Nil. (x) Irrigated. (xi) N.A. (xii) 11.10.1963 and 4.12.1963.

2. TREATMENTS :

**Main-plot treatments :**

6 levels of N as A/S: $N_0$=0, $N_1$=33·6, $N_2$=67·2, $N_3$=100·9, $N_4$=134·5 and $N_5$=168·1 Kg/ha.

**Sub-plot treatments :**

3 levels of $P_2O_5$ : $P_0$=0, $P_1$=22·4 and $P_2$=44·8 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6·7 m.× 4·3 m. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL ;

(i) Good. (ii) Nil. (iii) Height, width, number of tillers and yield of green matter. (iv) (a) 1960-63 (modified in 1963). (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 213·0 Q/ha. (ii) (a) 42·9 Q/ha. (b) 30·6 Q/ha. (iii) Main effect of N is highly significant and that of P is significant. (iv) Av. yield of grass in Q/ha.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $N_4$ | $N_5$ | Mean |
|---|---|---|---|---|---|---|---|
| $P_0$ | 108·5 | 137·5 | 211·9 | 159·5 | 333·8 | 330·3 | 213·6 |
| $P_1$ | 99·7 | 133·6 | 204·0 | 160·6 | 294·9 | 315·8 | 201·4 |
| $P_2$ | 94·4 | 182·6 | 218·9 | 173·9 | 318·0 | 356·5 | 224·0 |
| Mean | 100·9 | 151·2 | 211·6 | 164·7 | 315·6 | 334·2 | 213·0 |

C.D. for N marginal means=37·3 Q/ha.
C.D. for P marginal means=17·9 Q/ha.

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**Crop :- Grass.** **Ref :- Ms. 61(76).**
**Site :- Agri. College, Dharwar.** **Type :- 'M'.**

Object :— To study the effect of nitrogenous fertilizers on the yield of Grass.

1. BASAL CONDITIONS :

(i) Grass of improved variety was sown for seed multiplication. (ii) Light red soil. (iii) N.A. (iv) Napier. (v) Planted in 1958 with spacing 61 cm.×61 cm. (vi) N.A. (vii) 12·4 C.L./ha. of F.Y.M. spread and mixed. (viii) 3 interculturings. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) 31.10.61 and 26.12.61.

2. TREATMENTS:

**Main-plot treatments :**

4 sources of N : $S_1$=A/S (20% N), $S_2$=C/A/N (20% N), $S_3$=Nitrophos. (16% N+14% $P_2O_5$) and $S_4$= Nitrophos. (20% N+20% $P_2O_5$).

**Sub-plot treatments :**

4 levels of N : $N_0$=0, $N_1$=22·4, $N_2$=44·8 and $N_3$=67·2 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 6·7 m.× 4·9 m. (b) N.A. (v) 122 cm.×122 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Height, breadth, number of tillers and yield of green matter. (iv) (a) 1961-N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 125·8 Q/ha. (ii) (a) 46·0 Q/ha. (b) 16·4 Q/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grass in Q/ha.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | Mean |
|---|---|---|---|---|---|
| $S_1$ | — | 117·0 | 150·7 | 118·8 | 128·8 |
| $S_2$ | — | 123·0 | 141·9 | 159·0 | 141·3 |
| $S_3$ | — | 118·8 | 118·4 | 162·3 | 133·2 |
| $S_4$ | — | 126·7 | 154·0 | 188·2 | 156·3 |
| Mean | 83·4 | 121·4 | 141·2 | 157·1 | 125·8 |

C.D. for N marginal means=13·8 Q/ha.

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**Crop :- Grass.** **Ref :- Ms. 60(78).**

**Site :- Agri. College, Dharwar.** **Type :- 'MV'.**

Object:—To determine the effect of manurial and fertilizers treatments on growth, yield and chemical composition of different grass varieties.

1. BASAL CONDITIONS :

(i) Before planting in 1955, it was a waste land used as a grazing area and since 1956 manuring as per treatments. (ii) Red light soil. (iii) N.A. (iv) As per treatments. (v) Last week of July 1955. (vi) and (vii) N.A. (viii) 2 hallow ploughing with wooden plough, in between the lines which act as earthing operation, 2 or 3 intercultures during the year. Hand weeding once or twice. Gap filling whenever it is necessary. (ix) Nil. (x) Unirrigated. (xi) 99 cm. (xii) 3 cuttings during the year.

2. TREATMENTS:

**Main-plot treatments :**

All combinations of (1) and (2)

(1) 3 varieties of grass : $V_1$=Thin napier, $V_2$=Rhodes and $V_3$=Marval.

(2) 2 levels of F.Y.M.: $F_0$=0 and $F_1$=12·4 C.L./ha.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 4 levels of N : $N_0$=0, $N_1$=22·4, $N_2$=44·8 and $N_3$=67·2 Kg/ha.

(2) 3 levels of $P_2O_5$: $P_0$=0, $P_1$=22·4 and $P_2$=44·8 Kg/ha.

3.. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 12 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 6·1 m. ×4·3 m. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of grass matter. (iv) (a) 1955 to 60. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 380·0 Q/ha. (ii) (a) 80·5 Q/ha. (b) 25·3 Q/ha. (iii) Main effects of F, V, N, P and interaction N×P, F×N, V×N and V×P are highly significant. Interaction F×V is significant. (iv) Av. yield of grass in Q/ha.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $P_0$ | $P_1$ | $P_2$ | $V_1$ | $V_2$ | $V_3$ | Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $F_0$ | 308·5 | 343·0 | 332·0 | 386·3 | 333·9 | 343·0 | 350·5 | 529·2 | 204·8 | 293·3 | 342·5 |
| $F_1$ | 350·7 | 410·9 | 424·9 | 483·7 | 399·3 | 420·3 | 433·0 | 637·3 | 305·9 | 309·4 | 417·5 |
| Mean | 329·6 | 377·0 | 378·4 | 435·0 | 366·6 | 381·6 | 391·8 | 583·2 | 255·4 | 301·4 | 380·0 |
| 1 | 475·4 | 568·5 | 602·0 | 687·0 | 555·6 | 590·2 | 603·9 | | | | |
| $V_2$ | 231·7 | 255·0 | 250·7 | 284·1 | 246·0 | 250·0 | 270·1 | | | | |
| $V_3$ | 281·7 | 307·4 | 282·6 | 333·8 | 298·1 | 304·7 | 301·3 | | | | |
| $P_0$ | 299·4 | 366·3 | 380·3 | 420·3 | | | | | | | |
| $P_1$ | 348·3 | 391·9 | 373·1 | 413·3 | | | | | | | |
| $P_2$ | 341·1 | 372·7 | 381·8 | 471·4 | | | | | | | |

C.D. for F marginal means=24·4 Q/ha.
C.D. for V marginal means=29·9 Q/ha.
C.D. for N marginal means=9.6 Q/ha.
C.D. for P marginal means=8·3 Q/ha.
C.D. for N means at the same level of F=13·6 Q/ha.
C.D. for F means at the same level of N=27·1 Q/ha.
C.D. for N means at the same level of V=16·7 Q/ha.
C.D. for V means at the same level of N=33·2 Q/ha.
C.D. for P means at the same level of V=14·4 Q/ha.
C.D. for V means at the same level of P=32·1 Q/ha.
C.D. for body of N×P table=11·8 Q/ha.
C.D. for body of F×V table=42·3 Q/ha.

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**Crop :- Grass.** **Ref :- Ms. 62(74), 63(62).**

**Site :- Agri. College, Dharwar.** **Type :- 'C'.**

Object :—To find out the optimum spacing for Grass to get the maximum yield.

1. BASAL CONDITIONS :

(i) N.A. (ii) Light red soil. (iii) N.A. (iv) Hybrid no. 4. (v) Transplanted on 6 and 7.8.1961. Spacing as per treatments. (vi) N.A. (vii) 12·4 C.L./ha. of F.Y.M. spread and mixed ; N.A. (vii) 3 interculturings and 2 weedings ; 3 interculturings and 1 weeding. (ix) Nil. (x) Unirrigated. (xi) 87 cm. ; N.A. (xii) 24.9.1962 ; 24.10.1963.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 row spacings : $R_1$=30, $R_2$=61, $R_3$=91 and $R_4$=122 cm.
(2) 4 plant spacings : $S_1$=30, $S_2$=61, $S_3$=91 and $S_4$=122 cm.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 7·3 m.×3·7 m. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Height, width, number of tillers and leaves and yield of green matter. (iv) (a) 1962 to 63. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

62(74)

(i) 48·8 Q/ha. (ii) 12·4 Q/ha. (iii) Main effect of R alone is significant. (iv) Av. yield of grass in Q/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $R_1$ | 61·9 | 47·0 | 49·2 | 58·5 | 54·2 |
| $R_2$ | 57·2 | 49·6 | 50·4 | 49·6 | 51·7 |
| $R_3$ | 40·3 | 44·9 | 42·8 | 39·0 | 41·7 |
| $R_4$ | 47·0 | 42·4 | 47·5 | 53·4 | 47·6 |
| Mean | 51·6 | 46·0 | 47·5 | 50·1 | 48·8 |

C.D. for R marginal means=8·8 Kg/ha.

63(62)

(i) 30·9 Q/ha. (ii) 8·3 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of grass in Q/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $R_1$ | 30·4 | 27·1 | 29·4 | 38·3 | 31·3 |
| $R_2$ | 33·6 | 32·7 | 34·5 | 26·2 | 31·8 |
| $R_3$ | 27·1 | 29·9 | 31·8 | 25·7 | 28·6 |
| $R_4$ | 31·8 | 29·9 | 32·2 | 33·6 | 31·9 |
| Mean | 30·7 | 29·9 | 32·0 | 31·0 | 30·9 |

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**Crop :- Grass.** **Ref. :- Ms. 60(72), 61(75), 62(72), 63(58).**
**Site :- Agri. College, Dharwar.** **Type :- 'C'.**

Object :— To find the best method of establishing the Grass by different methods of planting.

1. BASAL CONDITIONS :

(i) Improved grass grown for multiplication, manured with 12·4 C.L /ha. of F.Y.M. (ii) Red light soil. (iii) N.A. (iv) Thin napier. (v) August 1960. Spacing and methods of planting as per treatments. (vi) N.A. (vii) 12·4 C.L./ha. of F.Y.M. spread and mixed. (viii) Hand weeding and gap filling in 1960 ; 3 interculturings, one hand weeding and gap filling whenever necessary in 1961, 1962 and 6 interculturings and 2 weedings in 1963. (ix) Nil. (x) Unirrigated. (xi) 99 cm. ; N.A. for others. (xii) 2 to 5 cuttings during Oct. to Dec. for 1960, 1961 ; 17.10.1962 and 20.11.1962 ; 27.8.1993 to 3.11.1963.

2. TREATMENT :

4 methods of planting : $M_1$=Hand broadcasting at 6 Kg/ha. of seed, $M_2$=Sown by country drill with 46 cm. spacing between rows, $M_3$=Transplanting of seedlings with 61 cm.×61 cm. spacing and $M_4$=Transplanting of Tussocks with 61 cm.×61 cm. spacing.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 14·0 m.×7·9 m. in 1960 and 1961 ; 14·3 m.×8·2 m. in 1962 and 1963. (b) N.A. (v) 61 cm.×61 cm. in 1960 and 1961 and 46 cm.×46 cm. in 1962 and 1963. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of green grass. (iv) 1960—contd (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

60(72)

(i) 43·0 Q/ha. (ii) 6·1 Q/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grass in Q/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ |
|---|---|---|---|---|
| Av. yield | 64·5 | 50·1 | 32·0 | 25·2 |

C.D.=9·7 Q/ha.

61(75)

(i) 233·4 Q/ha. (ii) 38·9 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grass in Q/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ |
|---|---|---|---|---|
| Av. yield | 210.2 | 199·4 | 248·9 | 275·0 |

62(72)

(i) 118·9 Q/ha. (ii) 12·2 Q/ha. (iii) Treatment differences are significant. (iv) Av. yield of grass in Q/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ |
|---|---|---|---|---|
| Av. yield | 97·4 | 122·7 | 127·5 | 128·0 |

C.D.=19·5 Q/ha.

63(58)

(i) 112·7 Q/ha. (ii) 13·8 Q/ha. (iii) Treatment differences are significant. (iv) Av. yield of grass in Q/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ |
|---|---|---|---|---|
| Av. yield | 93·7 | 122·5 | 111·6 | 123·0 |

C.D.=22·1 Q/ha.

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**Crop :- Grass.** **Ref :- Ms. 62(73).**

**Site :- Agri. College, Dharwar.** **Type :- 'CV'.**

Object :—To find out the optimum spacing of different varieties of Grass.

1. BASAL CONDITIONS :

(i) N.A (ii) Light red soil. (iii) N.A. (iv) As per treatments. (v) 18 and 19.7.1962. (vi) N.A. (vii) 12·4 C.L./ha. of F.Y.M. spread and mixed. (viii) 2 wooden ploughings and once *gura* operation. (ix) Nil. (x) Unirrigated. (xi) 87 cm. (xii) 24.10.1962.

2. TREATMENTS :

All combinations of (1) and (2)
(i) 2 varieties of grass : $V_1$=Thin napier and $V_2$=Guinea grass.
(2) 4 spacings : $S_1$=30 cm. × 30 cm. ; $S_2$=46 cm. × 46 cm. ; $S_3$=61 cm × 61 cm. and $S_4$=91 cm. × 91 cm.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) 7·3 m. × 5·5 m. (b) N.A. (v) Nill. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Height, breadth, number of tillers and yield of green matter. (iv) 1962—contd (modified in 1963). (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 92·0 Q/ha. (ii) 21·4 Q/ha. (iii) Main effect of S is highly significant and that of V is significant. (iv) Av. yield of grass in Q/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $V_1$ | 146·2 | 114·1 | 89·3 | 64·4 | 103·5 |
| $V_2$ | 90·0 | 89·7 | 64·8 | 77·2 | 80·4 |
| Mean | 118·1 | 101·9 | 77·0 | 70·8 | 92·0 |

C.D. for S marginal means=26·5 Q/ha.
C.D. for V marginal means=18·8 Q/ha.

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**Crop :- Grass.**
**Site :- Agri. College, Dharwar.**

**Ref :- Ms. 63(60).**
**Type :- 'CV'.**

Object :—To find the optimum spacing for different varieties of Grass.

1. BASAL CONDITIONS :

(i) N.A. (ii) Light red soil. (iii) N.A. (iv) As per treatments. (v) 18 and 19.7.1962. (vi) and (vii) N.A. (viii) 4 interculturings and 2 hand weedings. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) 17.8.1963 and 26.10.1963.

2. TREATMENTS :

**Main-plot treatments :**

2 varieties of grass : $V_1$=Thin napier and $V_2$= Guinea grass.

**Sub-plot treatments :**

4 spacings : $S_1$=30 cm.×30 cm., $S_2$=46 cm.×46 cm., $S_3$=61 cm.×61 cm., and $S_4$=91 cm.× 91 cm.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 7·3 m. ×5·5 m. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Height, width, number of tillers and yield of green grass. (iv) 1962—contd. (modified in 1963). (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 115·6 Q/ha. (ii) (a) 16·5 Q/ha. (b) 15·7 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of grass in Q/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $V_1$ | 146·9 | 144·7 | 108·5 | 126·2 | 131·6 |
| $V_2$ | 99·8 | 95·3 | 101·0 | 102·5 | 99·6 |
| Mean | 123·4 | 120·0 | 104·8 | 114·4 | 115·6 |

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**Crop :- Grass.** **Ref :- Ms. 60(71).**

**Site :- Agri. College, Dharwar.** **Type :- 'CV'.**

Object :—To study the effect of varying number of cuttings on the yield of different species of Grass.

1. BASAL CONDITIONS :

(i) Until 1955, it was a grazing land and since 1956 F.Y.M. at 12·4 C.L./ha. was applied. (ii) Red light soil. (iii) N.A. (iv) As per treatments. (v) Transplanted in Aug. 1955. (vi) N.A. (vii) 12·4 C.L./ha. of F.Y.M. was given during June 1960. Spreading and mixing. (viii) Interculturing, band weeding and gap filling. (ix) Nil. (x) Unirrigated. (xi) 99 cm. (xii) N.A.

2. TREATMENTS

**Main-plot treatments :**

5 species of grass : $S_1$=Elephant grass, $S_2$=Segregate no. 4, $S_3$=Segregate no. 9, $S_4$=Segregate no. 5 and $S_5$=Segregate no. 3.

**Sub-plot treatments ;**

4 cuttings : $C_1$=Single cutting, $C_2$=2, $C_3$=3 and $C_4$=4 cuttings.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 6·1 m. ×4·3 m. (b) N.A. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of green matter. (iv) (a)1955 to 60. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 69·9 Q/ha. (ii) (a) 20·6 Q/ha. (b) 8·8 Q/ha. (iii) Main effects of S, C and interaction S×C are highly significant. (iv) Av. yield of grass in Q/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | Mean |
|---|---|---|---|---|---|---|
| $C_1$ | 54·0 | 72·6 | 22·7 | 36·1 | 38·9 | 44·9 |
| $C_2$ | 60·4 | 103·5 | 36·0 | 54·1 | 58·1 | 62·4 |
| $C_3$ | 75·6 | 115·1 | 56·4 | 69·8 | 84·3 | 80·2 |
| $C_4$ | 101·2 | 139·5 | 39·5 | 79·6 | 100·0 | 92·0 |
| Mean | 72·8 | 107·7 | 38·6 | 59·9 | 70·3 | 69·9 |

C.D. for S marginal means=19·3 Q/ha.
C.D. for C marginal means=6·5 Q/ha.
C.D. for C means at the same level of S=14·6 Q/ha.
C.D. for S means at the same level of C=23·1 Q/ha.

**Crop :- Grass.** **Ref :- Ms. 60(70).**

**Site :- Agri. College, Dharwar.** **Type :- 'CV'.**

Object :—To study the effect of varying the number of cuttings on the yield of different species of Grass.

1. BASAL CONDITIONS :

(i) Until 1955, the land was used as a grazing land. Since 1955, manured at 12·4 C.L./ha. of F.Y.M. (ii) Red light soil having depth 25 cm. to 30 cm. (iii) N.A. (iv) As per treatments. (v) Transplanting in July 1955. (vi) N.A. (vii) 12·4 C.L./ha. of F.Y.M. was given during June 1960, spreading and mixing. (viii) Interculture, hand weedings and gap filling. (ix) Nil. (x) Unirrigated. (xi) 99 cm. (xii) N.A.

2. TREATMENTS :

**Main-plot treatments :**

6 species of grass : $S_1$=Thin Napier, $S_2$=Rhodes, $S_3$=Blue panic, $S_4$=Aujan, $S_5$=Mared and $S_6$= Amphilophis glabra.

**Sub-plot treatments :**

3 cuttings : $C_1$=Single cutting, $C_2$=2 and $C_3$=3 cuttings.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6·1 m. ×4·3 m. (b) N.A. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Not good. (ii) Nil. (iii) Yield of green matter. (iv) 1955 to 60. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS ;

(i) 72·9 Q/ha. (ii) (a) 26·6 Q/ha. (b) 14·2 Q/ha. (iii) Main effects of S, C and interaction S×C are significant. (iv) Av. yield of grass in Q/ha.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | Mean |
|---|---|---|---|---|---|---|---|
| $C_1$ | 103·8 | 22·2 | 5·7 | 52·8 | 43·6 | 67·1 | 49·2 |
| $C_2$ | 124·7 | 45·8 | 22·2 | 73·2 | 78·9 | 72·4 | 69·5 |
| $C_3$ | 158·2 | 62·3 | 42·3 | 102·4 | 132·1 | 102·4 | 100·0 |
| Mean | 128·9 | 43·4 | 23·4 | 76·1 | 84·9 | 80·6 | 72·9 |

C.D. for S marginal means=23·1 Q/ha.
C.D. for C marginal means=8·3 Q/ha.
C.D. for C means at the same level of S=20·4 Q/ha.
C D. for S means at the same level of C=28·5 Q/ha.

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**Crop :- Cardamom.** **Ref :- Ms. 63(178), 64(136).**

**Site :- Reg. Spices Res. Stn., Chethally.** **Type :- 'C'.**

Object : To find out optimum spacing for Cardamom under malnad conditions in Mysore State.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Medium black. (iii) Seedlings. (iv) Manjarabad. (v) June 1961. (vi) N.A. (vii) Nil. (viii) Weeding, digging etc. (ix) Nil. (x) Unirrigated. (xi) 158 cm. ; 231 cm. (xii) N.A.

2. TREATMENTS :

7 spacings in cm. : $S_1$=120×120, $S_2$=180×180, $S_3$=240×240, $S_4$=300×300, $S_5$=370×370, $S_6$=430×430 and $S_7$=490×490.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 3. (iv) (a) and (b) 14·6 m.×19·5 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of dried cured cardamom. (iv) 1963—contd. (v) Nil. (vi) to (vii) Nil.

5. RESULTS :

**63(178)**

(i) 76·9 Kg/ha. (ii) 48·7 Kg/ha. (iii) Treatments differences are significant. (iv) Av. yield of cured cardamom in Kg/ha.

| Treatment | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | $S_7$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 181·0 | 133·7 | 85·4 | 59·6 | 24·2 | 32·0 | 22·5 |

C.D.=86·7 Kg/ha.

**64(136)**

(i) 42·3 Kg/ha. (ii) 16·6 Kg/ha. (iii) Treatments differences are highly significant. (iv) Av. yield of cured cardamom in Kg/ha.

| Treatment | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | $S_7$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 80·9 | 60·6 | 29·8 | 57·1 | 27·9 | 25·7 | 14·4 |

C.D.=29·6 Kg/ha.

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**Crop :- Cardamom.** **Ref :- Ms. 64(134).**

**Site :- Reg. Spices Res. Stn., Chethally.** **Type :- 'C'.**

Object :—To determine the optimum spacing and size of the seedlings for transplanting in second nursery bed.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Medium black. (iii) Seedlings. (iv) Manjarabad. (v) 21st January, 1963. (vi) N.A. (vii) Nil. (viii) Weedings. (ix) Nil. (x) Pot watering. (xi) 231 cm. (xii) Observation taken during May, 1964.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 spacings : $S_1$=15 cm.×15 cm., $S_2$=23 cm.×23 cm. $S_3$=30 cm.×30 cm. and $S_4$=38 cm.×38 cm.

(2) 3 sizes of the seedlings : $L_1$=Seedlings with 2 leaves, $L_2$=Seedlings with 3 leaves and $L_3$=Seedlings with 4 leaves.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) 12·2 m.×12·2 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Height in cm./plant. (iv) (a) 1963 only. (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 17·7 cm./plant. (ii) 3·76 cm./plant. (iii) No effect is significant. (iv) Mean height in cm./plant.

| | $S_1$ | $S_2$ | $S_3$ | $S_4$ | Mean |
|---|---|---|---|---|---|
| $L_1$ | 18·8 | 14·9 | 14·4 | 15·1 | 15·8 |
| $L_2$ | 20·9 | 19·3 | 16·5 | 17·7 | 18·6 |
| $L_3$ | 19·9 | 19·5 | 17·3 | 18·4 | 18·8 |
| Mean | 19·9 | 17·9 | 16·1 | 17·1 | 17·7 |

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**Crop :- Cardamom.** **Ref :- Ms. 62(180).**

**Site :- Reg. Spices Res. Stn., Chethally.** **Type :- 'C'.**

Object : —To determine the viability of Cardamom seeds.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Medium black. (iii) Seedlings. (iv) Manjarabad. (v) June 1962. Spacing 25 cm. ×25 cm. (vi) and (vii) Nil. (viii) Weeding. (ix) Nil. (x) Pot watering. (xi) 206 cm. (xii) Observation taken 35 days after sowing.

2. TREATMENTS :

6 cultural treatments : $T_1$=Sown in nursery beds immediately after extraction, $T_2$=Stored for 3 days after extraction and sown in nursery bed, $T_3$=Stored for 6 day after extraction and sown in nursery bed, $T_4$=Stored for 9 days after extraction and sown in nursery bed, $T_5$=Stored for 12 days after extraction and sown in nursery bed and $T_6$=Stored for 15 days after extraction and sown in nursery bed.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) 100 seeds/treatment. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) % of germination. (iv) (a) 1962 only. (b) —. (c) —. (v) No. (vi) to (vii) Nil.

5. RESULTS :

(i) 42·3 degrees. (ii) 9·1 degrees. (iii) Treatment differences are not significant. (iv) Mean percentage of germination.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Mean angle in degrees | 43·0 | 40·5 | 40·9 | 43·1 | 43·1 | 43·1 |
| Percentage transformed | 46·5 | 42·2 | 42·9 | 46·7 | 46·7 | 46·7 |

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**Crop :- Cardamon.** **Ref :- Ms. 63(177).**

**Site :- Reg. Spices Res. Stn., Chethally.** **Type :- 'C'.**

Object :—To determine the optimum mulch for nursery beds.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Medium black. (iii) Seedlings. (iv) Manjarabad. (v) 26.1.63. spacing 15 cm.×15 cm. (vi) Nursery. (vii) Nil. (viii) Weeding. (ix) Nil. (x) Pot watering. (xi) 158 cm. (xii) 2.3.63.

2. TREATMENTS :

6 cultural treatments : $T_1$=Seed bed covered with paddy husk, $T_2$=Seed bed covered with paddy mulch, $T_3$=Seed bed covered with paddy straw, $T_4$=Seed bed covered with saw dust, $T_5$=Seed bed covered with Coffee husk and $T_6$=Seed bed covered with polythene sheet.

3. DESIGN :

(i) R.B.D. (ii) 6. (b) N.A. (iii) 4. (iv) 100 seeds/treatment. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) % of germination. (iv) (a) 1962—only. (b) N.A. (c) Nil. (v) N.A. (vi) an (vii) Nil.

5. RESULTS :

(i) 22·5 degrees. (ii) 11·0 degrees. (iii) Treatment differences are highly significant. (iv) Mean % of germination in degrees.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Mean angle in degrees | 17·9 | 12·8 | 52·3 | 18·3 | 20·4 | 12·9 |
| Percentage (Transformed back) | 9·4 | 4·9 | 62·6 | 9·9 | 12·2 | 5·0 |

C.D.=16·6 degrees.

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**Crop :- Cardamon.** **Ref :- Ms. 64(70 to 76).**

**Site :- Cardamon Res. Stn., Mudigere.** **Type :- 'D'.**

Object :—To find out the effect of treating the seed with different alkaline and acidic treatments on seedlings.

1. BASAL CONDITIONS :

(i) Grass growing land. (ii) Sandy loam. (iii) By seedlings. (iv) Local. (v) 1964. (vi) Only seeds were sown. (vii) to (ix) Nil. (x) Unirrigated. (xi) 227 cm. (xii) N.A.

2. TREATMENTS :

5 periods of treating the seeds : $T_0$=Control (no treatment), $T_1$=3, $T_2$=8, $T_3$=13 and $T_4$=18 minutes. Seeds were treated with 50% Sulphuric acid, 50% Hydrochloric acid, 50% Nitric acid, 25% Sulphuric acid, 25% Hydrochloric acid, 20% $K_0H$ and 10% Glucical ascetic acid in expt nos. 64(70), 64(71), 64(72), 64(73), 64(74), 64(75) and 64(76) respectively.

3, DESIGN :

(i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) 100 seeds/plot. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil . (iii) No. of seedlings/plot. (iv) (a) 1964 - N.A. (b) N.A. (c) Nil. (v) and (vi) Nil. (vii) Results given for different acidic and alkaline treatments separately.

5. RESULTS :

**64(70) 50% Sulphuric acid**

(i) 25 seedlings/plot. (ii) 9·1 seedlings/plot. (iii) Treatment differences are highly significant. (iv) Av. number of seeds germinated/plot.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. number | 35 | 20 | 29 | 27 | 12 |

C.D.=12·5 seedlings/plot.

**64(71) 50% Hydrochloric acid**

(i) 2 seedlings/plot. (ii) 8·4 seedlings/plot. (iii) Treatment differences are not significant. (iv) Av. number of seedlings germinated/plot.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|

### 64(72) 50% Nitric acid

(i) 17 seedlings/plot. (ii) 8·5 seedlings/plot. (iii) Treatment differences are not significant. (iv) Av. number of seeds germinated/plot.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. number | 15 | 16 | 21 | 26 | 9 |

### 64(73) 25% Sulphuric acid

(i) 15 seedlings/plot. (ii) 9·5 seedlings/plot. (iii) Treatment differences are not significant. (iv) Av. number of seeds germinated/plot.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. number | 19 | 16 | 15 | 13 | 12 |

### 64(74) 25% Hydrochloric acid

(i) 7 seedlings/plot. (ii) 8·3 seedlings/plot. (iii) Treatment differences are not significant. (iv) Av. number of seeds germinated/plot.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. number | 15 | 7 | 5 | 5 | 5 |

### 64(75) 20% $K_2H$

(i) 5 seedlings/plot. (ii) 2·4 seedlings/plot. (iii) Treatment differences are highly significant. (iv) Av. number of seeds germinated/plot.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. numbrr | 11 | 4 | 3 | 2 | 6 |

C.D.=3·3 seedlings/plot.

### 64(75) 10% Glucical Ascetic acid

(i) 8 seedlings/plot. (ii) 0·5 seedlings/plot. (iii) Treatment differences are highly significant. (iv) Av. number of seeds germinated/plot.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. number | 10 | 7 | 8 | 7 | 7 |

C.D.=0·7 seedlings/plot.

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**Crop :- Pepper.** **Ref :- Ms. 64(135).**

**Stte :- Reg. Spices Res. Stn., Chethally.** **Type :- 'C'.**

Object :—To determine the kind of cutting to be selected for planting.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Medium black. (iii) By planting cutting (unrooted cuttings). (iv) *Kallu valli*. (v) 18.1.64. (vi) Cuttings. (vii) Nil. (viii) Weeding. (ix) Nil. (x) Unirrigated. (xi) 231 cm. (x) 18.5.64.

2. TREATMENTS :

5 kinds of cuttings : $T_1=1$, $T_2=2$. $T_3=3$, $T_4=4$ and $T_5=5$ node cuttings.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) 50 cuttings. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Sprouting percentage. (*iv*) (a) 1964—only. (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 32·3 degrees. (ii) 7·2 degrees. (iii) Treatment differences are highly significant. (iv) Means of sprouting in degrees and percentages.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Mean angle in degrees | 6·8 | 23·8 | 46·2 | 37·3 | 47·1 |
| Percentage (Transformed back) | 1·4 | 16·3 | 52·1 | 37·2 | 53·7 |

C.D.=8·6 degrees.

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**Crop :- Chillies** (*Kharif*). **Ref :- Ms. 60(113).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'M'.**

Object :—To study the response of Chillies crop at different levels of N, P and K.

1. BASAL CONDITIONS :

(i) (a) *Jowar*—chillies. (b) *Jowar*. (c) 12·4 C.L./ha. of F.Y.M. as basal dose and 28 Kg/ha. of N+16·8 Kg/ha. of $P_2O_5$ in two equal doses. First half at the time of sowing and second half 1 month after sowing. (ii) Black soil. (iii) 4th week of June 1960. (iv) (a) 2 harrowings, tractor ploughing. (b) Transplanting. (c) —. (d) 91 cm.×91 cm. (e) 2. (v) Spot manuring of F.Y.M.—one handful/hill before transplanting chillies seedlings. (vi) Chillies (*Byadgi*). (vii) Unirrigated. (viii) 6 to 7 interculturings, 2 weedings. (ix) 71 cm. (x) 4 pickings from 5.11.1960. to 8.1.1961.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=22·4$ and $N_2=44·8$ Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_0=0$,$P_1=22·4$ and $P_2=44·8$ Kg/ha.
(3) 3 levels of $K_2O$ as Mur. Pot. : $K_0=0$, $K_1=22·4$ and $K_2=44·8$ Kg/ha.

3. DESIGN :

(i) $3^3$ Confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 11·0 m.×7·3 m. (b) 9·1 m.×5·5 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Regular spraying was taken up against pests and '*murda*' disease at an internal of 8 to 10 days thrice. A mixture of Hexedol ·950 (50% wettable BHC)+wettable sulphur, 454 gm. each in 114 litres of water sprayed. (iii) Height, spread, no. of fruits/plant, weight of dry fruits. (iv) (a) 1957 to 1960. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 1161 Kg/ha. (ii) 243·0 Kg/ha. (iii) N effect is highly significant. P effect is significant. (iv) Av. yield of chillies in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $P_0$ | 849 | 1145 | 1151 | 1050 | 907 | 1187 | 1048 |
| $P_1$ | 997 | 1366 | 1460 | 1444 | 1241 | 1137 | 1274 |
| $P_2$ | 1006 | 1099 | 1374 | 1091 | 1218 | 1170 | 1160 |
| Mean | 951 | 1203 | 1328 | 1195 | 1122 | 1165 | 1161 |
| $K_0$ | 988 | 1233 | 1363 | | | | |
| $K_1$ | 877 | 1179 | 1311 | | | | |
| $K_2$ | 988 | 1198 | 1310 | | | | |

C.D. for N or P marginal means=168·0 Kg/ha.

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**Crop :- Chillies (*Kharif*).** **Ref :- Ms. 63(77).**

**Site :- Agri. Res. Stn., Hebbal.** **Type :- 'MV'.**

Object :—To study the effect of N,P and K fertilizers and the most suitable time of transplanting for different varieties of Chillies.

1. BASAL CONDITIONS :

(i) (a) *Ragi*—Chillies. (b) *Ragi*. (c) 12·4 C.L./ha. of F.Y.M. (ii) Red sandy soil. (iii) As per treatments. (iv) (a) to (e) N.A. (v) 24·7 C.L./ha. of F.Y.M. (vi) As per treatments. (vii) Unirrigated (viii) 4 intercultivations. (ix) 60 cm. (x) 23.10.63, 11.11.63 and 2.12.63.

2. TREATMENTS :

All combinations of (1), (2), (3), (4) and (5)
(1) 2 varieties : $V_1$=Guntur and $V_2$=Goribidanur.
(2) 2 dates of transplanting : $D_1$=First fortnight of July and $D_2$=2nd fortnight of July.
(3) 2 levels of N : $N_1$=33·6 and $N_2$=67·2 Kg/ha.
(4) 2 levels of $P_2O_5$ : $P_1$=22·4. and $P_2$=44·8 Kg/ha.
(5) 2 levels of $K_2O$ : $K_1$=22·4 and $K_2$=44·8 Kg/ha.

3. DESIGN :

(i) $2^5$ Fact. (ii) (a) 32. (b) N.A. (iii) 1. (iv) (a) 5·0 m.×6·1 m. (b) 4·4 m.×4·9 m. (v) 30 cm.×61 cm (vi) Yes.

GENERAL :

(i) Fair. (ii) Affected by virus to some extent. No control measures taken. (iii) No. of fruits/picking and yield data. (iv) (a) 1963 only. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 303·3 Kg/ha. (ii) 102·8 Kg/ha. (iii) Only K effect is significant. (iv) Mean and differential response table in Kg/ha.

| | Mean response | Differential response | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | V | | D | | N | | P | | K | |
| | | — | + | — | + | — | + | — | + | — | + |
| V | —75·2 | — | — | —51·6 | —98·6 | —84·5 | —65·7 | —51·6 | —98·6 | —65·7 | —84·5 |
| D | —39·9 | —14·1 | —65·7 | — | — | —4·7 | —75·1 | —42·2 | —37·6 | —56·3 | —23·5 |
| N | +54·0 | 46·9 | 61·0 | 89·2 | 18·8 | — | — | 37·6 | 70·4 | 98·6 | 9·4 |
| P | 18·8 | 42·2 | —4·7 | 14·1 | 23·5 | 4·7 | 32·9 | — | — | —42·2 | 79·8 |
| K | —89·2 | —98·6 | —79·8 | —103·3 | —75·1 | —46·9 | —131·4 | —150·2 | —28·2 | — | — |

C.D. for mean response of K=76·6 Kg/ha.

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**Crop :- Citrus.** **Ref :- Ms. 60(261), 61(252), 62(253).**

**Site :- Horticultural Farm, Gonicoppal.** **Type :- 'M'.**

Object :—To study the effect of spraying micro-nutrients on the plants showing symptoms of chlorosis.

1. BASAL CONDITIONS :

(i) Jungle. (ii) Black loam. (iii) Seedlings. (iv) Coorg mandarin. (v) Old garden. (vi) One year. (vii) 0·4 Kg. of N+0·2 Kg. of $P_2O_5$+0·2 Kg. of $K_2O$/plant in two doses. (viii) Weeding twice prunning and mulching. (ix) Nil. (x) Unirrigated. (xi) 266 cm. ; 285 cm. ; 402 cm. (xii) April 1960 ; May 1961 ; May 1962.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)
(1) 2 levels of Zinc : $A_0$=0 and $A_1$=Zinc.
(2) 2 levels of Manganese : $B_0$=0 and $B_1$=Manganese.
(3) 2 levels of Copper: $C_0$=0 and $C_1$=Copper.
(4) 2 levels of Iron : $D_0$=0 and $D_1$=Iron.

Control plot with '0000' treatments was sprayed by water while other micro-nutrients were sprayed twice during the year.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 3. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) As per treatments. (iii) % of chlorosis. (iv) 1955 to 62. (v) to (vii) Nil. (viii) Data analysed after transformation of percentages into degrees.

5. RESULTS :

**60(261)**

(i) 26·2 degrees/tree. (ii) 4·7 degrees/tree. (iii) Main effect of A is highly significant. Interaction ABC and ABD are significant. (iv) Mean and differential responses in degrees/tree (Percentage of chlorotic leaves on whole tree basis—mean of 3 plants).

| | | Differential response | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Effect | Mean response | A | | B | | C | | D | |
| | | — | + | — | + | — | + | — | + |
| A | −5·43 | — | — | −5·62 | −5·24 | −7·25 | −3·61 | 4·35 | −6·52 |
| B | −1·12 | −1·31 | −0·94 | — | — | −3·24 | 0·98 | −0·46 | −1·78 |
| C | −0·30 | −2·12 | 1·51 | −2·42 | 1·81 | — | — | 2·57 | −3·18 |
| D | 1·02 | 2·10 | −0·05 | 1·68 | 0·36 | 3·90 | −1·85 | — | — |

C.D. for mean response of A=2·8 degrees.

**61(252)**

(i) 35·6 degrees/tree. (ii) 4·6 degrees/tree. (iii) Interaction ABD alone is significant. (iv) Mean and differential responses in degrees/tree (Percentage of chlorotic leaves on whole trees basis—mean of 3 plants).

| | | Differential response | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Effect | Mean response | A | | B | | C | | D | |
| | | — | + | — | + | — | + | — | + |
| A | −2·25 | — | — | −3·82 | −0·68 | −0·91 | −3·59 | −4·08 | −0·42 |
| B | 0·42 | −1·14 | 1·99 | — | — | −1·38 | 2·23 | 1·27 | −0·43 |
| C | 0·76 | 2·11 | −0·57 | −1·04 | 2·57 | — | — | 2·73 | −1·19 |
| D | 0·82 | −1·00 | 2·65 | 1·67 | −0·02 | 2·79 | −1·14 | — | — |

62(253)

(i) 26·4 degrees/tree. (ii) 4·9 degrees/tree. (iii) Only A effect is highly significant. (iv) Mean and differential responses in degrees/tree (Percentage of chlorotic leaves on whole trees basis—Mean of 3 plants).

| Effect | Mean response | Differential response | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | A | | B | | C | | D | |
| | | — | + | — | + | — | + | — | + |
| A | —5·72 | — | — | —5·62 | —5·82 | —7·83 | —3·61 | —4·93 | —6·52 |
| B | —0·84 | —0·74 | —0·94 | — | — | —2·67 | 0·98 | 0·10 | —1·78 |
| C | —0·59 | —2·70 | 1.51 | - 2·42 | 1·23 | — | — | 1·99 | —3·18 |
| D | —0·73 | 1·53 | —0·05 | 1·68 | —0·20 | 3·33 | —1·85 | — | — |

C.D. for mean response of A=2·9 degrees

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**Crop :- Citrus.** **Ref :- Ms. 60(257), 61(248), 65(14).**

**Site :- Horticultural Farm, Gonicoppal.** **Type :- 'C'.**

Object :—To study the influence of various root stocks on Citrus.

1. BASAL CONDITIONS :

(i) Jungle. (ii) Black loam. (iii) Buddings. (iv) Coorg—Orange. (v) July 1956. spacing 6·1 m. between two plants. (vi) 2 years after sowing. (vii) 0·7 Kg. of N+0·5 Kg. of $P_2O_5$+0·3 Kg. of $K_2O$/tree in two doses as C/A/N, Super and Mur. Pot. respectively in 1960; 0·8 Kg. of N+0·6 Kg. of $P_2O_5$+1·0 Kg. of $K_2O$/tree in 3 split doses in organic and inorganic form+9·1 Kg/tree of dolomit in 1965; 41 Kg. of C.M./tree basal dressed in 1961. (viii) 4 weedings around the trees, scrapping, mulching, prunning and clean cultivation. (ix) Nil. (x) Unirrigated. (xi) Nil. (xii) Nov. to Dec. 1960; Nov. 1961 to Feb. 62; and Nov. 1965 to Feb. 66.

2. TREATMENTS :

8 varieties of root stocks : $T_1$=Pumclo-c-grandis (Linn) oslack, $T_2$=Lime Sadaphal- C- species, $T_3$=Grape fruits -C- paxadisi Macf, $T_4$=Kodeki Thuli-C- species, $T_5$=Rough lemon-C-Jamburi Lusington, $T_6$=Seedlings-C- reticulato Swingle (control), $T_7$=Lemon-C- (Linn) Osbeck and $T_8$=Molepuli-C-species.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6. (v) One row of seedlings around each replication. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Aphids, mealy bug and stem borer. Control measures taken. (iii) Height and girth in 1960, 1961 and 1965; Fruit yield in 1965. (iv) (a) 1956—indefinite. (b) N.A. (c) Nil. (v) Nil. (vi) No. (vii) N.A.

5. RESULTS :

**60(257)**

**Girth in cm./tree**

(i) 28·3 cm./tree. (ii) 3·5 cm./tree. (iii) Treatment differences are highly significant. (iv) Av. girth in cm./tree.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|
| Av. girth | 26·4 | 28·1 | 26·4 | 29·7 | 36·9 | 28·5 | 24·3 | 26·1 |

C.D.=5·2 cm./tree.

**Height in m./tree**

(i) 2·9 m./tree. (ii) 0·4 m./tree. (iii) Treatment differences are highly significant. (iv) Av. height in m./tree.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|
| Av. height | 2·6 | 3·1 | 2·4 | 3·4 | 3·5 | 3·1 | 2·8 | 2·5 |

C.D.=0·6 m./tree.

**61(248)**

**Girth in cm./tree**

(i) 28 4 cm./tree. (ii) 3·4 cm./tree. (iii) Treatment differences are highly significant. (iv) Av. girth in cm./tree.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|
| Av. girth | 24·1 | 27·1 | 25·0 | 32·1 | 37·6 | 35·5 | 23·1 | 22·8 |

C.D.=4·9 cm./tree.

**Height in m./tree**

(i) 3·3 m./tree. (ii) 0·2 cm./tree. (iii) Treatment differences are highly significant. (iv) Av. height in m./tree.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|
| Av. height | 2·8 | 3·2 | 2·7 | 3·7 | 4·0 | 3·7 | 3·0 | 3·0 |

C.D.=0·3 m./tree.

**65(14)**

**Fruit yield**

(i) 295 fruits/tree. (ii) 124 fruits/tree. (iii) Treatment differences are highly significant. (iv) Av. no. of fruits/tree.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|
| Av. number | 103 | 148 | 279 | 566 | 534 | 477 | 134 | 117 |

C.D.=182·4 fruits/tree.

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**Crop :- Citrus.** **Ref :- Ms. 60(185), 61(183), 62(167), 63(170).**

**Site :- Reg. Fruit. Res. Stn., Chethally.** **Type :- 'C'.**

Object :—To establish the superiority of budded mandarin plants over the practice of raising seedlings plants.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Medium black. (iii) By buddings. (iv) Coorg Medium. (v) September 1953 (planted in pits) ; 6 m.×6 m. (vi) Age of budding 1 year and 7 months. (vii) 0·7 Kg. of N as organic manure+0·7 Kg. of $P_2O_5$+0·54 Kg. of $K_2O$ given for each plant in Sept, March and May. (viii) Weeding, scrapping and mulching the beds. (ix) Nil. (x) Unirrigated. (xi) 164 cm. ; 275 cm. ; 198 cm. and 146 cm. (xii) October to March.

2. TREATMENTS :

11 root stocks : $R_0$=Coorg orange seedlings (control—2 plots), $R_1$=Citron, $R_2$=Grape fruit, $R_3$=Coorg Sathgudi, $R_4$=Lemon, $R_5$=Coong Orange, $R_6$=Rough lemon, $R_7$=Baduvapuli, $R_8$=Pummelo, $R_9$=Sour Orange and $R_{10}$=Sweet lime.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Leaf fall and aphids and powdery mildew. Control measures taken—details N.A. (iii) Av. number of fruits/plant. (iv) (a) 1953—Contd. (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

**60(185)**

(i) 270 fruits/tree. (ii) 83·3 fruits/tree. (iii) Treatment differences are highly significant. (iv) Av. number of fruits/tree.

| Treatment | $R_0$ | $R_1$ | $R_2$ | $R_3$ | $R_4$ | $R_5$ | $R_6$ | $R_7$ | $R_8$ | $R_9$ | $R_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 178 | 84 | 385 | 357 | 169 | 249 | 307 | 305 | 346 | 364 | 322 |

C.D. for the comparison of $R_0$ with other treatments =103·9 fruits.
C.D. for the comperison of any two treatments other than $R_0$=119·9 fruits.

**61(183)**

(i) 306 fruits/tree. (ii) 113·8 fruits/tree. (iii) Treatment differences are not significant. (iv) Av. number of fruits/tree.

| Treatment | $R_0$ | $R_1$ | $R_2$ | $R_3$ | $R_4$ | $R_5$ | $R_6$ | $R_7$ | $R_8$ | $R_9$ | $R_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 272 | 177 | 433 | 331 | 332 | 235 | 293 | 367 | 336 | 282 | 343 |

**62(167)**

(i) 180 fruits/tree. (ii) 80·8 fruits/tree. (iii) Treatments differences are significant. (iv) Av. number of fruits/tree.

| Treatment | $R_0$ | $R_1$ | $R_2$ | $R_3$ | $R_4$ | $R_5$ | $R_6$ | $R_7$ | $R_8$ | $R_9$ | $R_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Av. number | 118 | 89 | 334 | 134 | 153 | 184 | 213 | 218 | 228 | 169 | 199 |

C.D. for the comparison of $R_0$ with other treatments=100·7 fruits
C.D. for the comparison of any two treatments other than $R_0$=116·3 fruits.

**63(170)**

(i) 356 fruits/tree. (ii) 169·0 fruits/tree. (iii) Treatment differences are significant. (iv) Av. number of fruits/tree.

| Treatment | $R_0$ | $R_1$ | $R_2$ | $R_3$ | $R_4$ | $R_5$ | $R_6$ | $R_7$ | $R_8$ | $R_9$ | $R_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Av. number | 206 | 258 | 438 | 358 | 407 | 132 | 372 | 491 | 598 | 372 | 433 |

C.D. for the comparison of $R_0$ with other treatment=210·7 fruits
C.D. for the comparison of any two treatments other than $R_0$=243·3 fruits.

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**Crop :- Citrus.** **Ref :- Ms. 60(187), 61(185), 62(169), 63(171).**
**Site :- Reg. Fruit Res. Stn., Chethally.** **Type :- 'C'.**

Object :—To determine the most desirable method of cultivation against the popular method of digging.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Medium black. (iii) Seedlings. (iv) Coorg mandarin. (v) Sept. 1954. (vi) One year. (vii) 0·7 Kg of N as organic manure+0·7 Kg of $P_2O_5$+0·54 Mur. Pot. for each plant given in Sept., March and May. (viii) Weeding, scrapping and mulching of beds and plant protection operations. (ix) Nil. (x) Unirrigated. (xi) 164 cm. ; 275 cm. ; 198 cm. and 146 cm. (xii) Not started bearing in 1960 ; October to March in other years.

2. TREATMENTS :

5 cultural treatments : $T_1$=Digging once in a year (control), $T_2$=Clean cultivation, $T_3$=Sod culture and mulching with dry leaves, $T_4$=Sod culture and $T_5$=No cultivation (spraying the area with 2,4—D to control weeds).

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) N.A. (b) 2. (v) One row for each treatment. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Leaf fall, aphids and powdery mildew, control measures taken (details N.A.) (iii) Girth, height, volume and number of fruits/tree. (iv) (a) 1960—Contd. (b) N.A. (c) Nil. (v) Not known. (vi) and (vii) Nil.

5. RESULTS :

**60(187)**

(i) 41·4 cm./tree. (ii) 6·0 cm./tree. (iii) Treatment differences are not significant. (iv) Av. girth at the stem in cm./tree.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. girth | 45·8 | 43·3 | 40·5 | 37·0 | 40·3 |

**61(185)**

(i) 37 fruits/tree (ii) 16·0 fruits/tree. (iii) Treatment differences are not significant. (iv) Av. number of fruits/tree.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. number | 44 | 37 | 31 | 35 | 37 |

**62(169)**

(i) 44·4 fruits/tree. (ii) 26·2 fruits/tree. (iii) Treatment differences are not significant. (iv) Av. number of fruits/tree.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| A v. number | 55 | 32 | 55 | 39 | 41 |

**63(171)**

(i) 37 fruits/tree. (ii) 22·6 fruits/tree. (iii) Treatment differences are not significant. (iv) Av. number of fruits/tree.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. number | 49 | 23 | 47 | 27 | 39 |

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**Crop :- Citrus.** **Ref :- Ms. 61(187), 62(175), 63(173).**

**Site :- Reg. Fruit Res. Stn., Chethally.** **Type :- 'C'.**

Object :—To study the effect of interplanting Coffee with orange in malnad area.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Medium black. (iii) Seedlings. (iv) Coorg—mandarin. (v) Sept. 1961 (6 m. between plants). (vi) One year. (vii) 136 gm. each of N, $P_2O_5$ and $K_2O$/tree in 1961, 270 gm. each of N and $P_2O_5$ and 180 gm. of $K_2O$/tree in 1962 and 400 gm. each of N and $P_2O_5$ and 270 gm. of $K_2O$/tree in 1963 in the form of organic manures in 3 instalments. Coffee plants received ½ the quantity of manure applied to Citrus in 1961 to 63. (viii) Nutritional sprays and tree production operations, weeding and scrapping. (ix) Coffee plant. (x) Unirrigated. (xi) 275 cm. ; 198 cm. ; 146 cm. (xii) Not started bearing in 1961 to 63.

2. TREATMENTS :

3 cultural treatments : $T_1$=Pure Orange, $T_2$=Orange+Coffee arabica with usual shade for coffee and $T_3$=Orange+Coffee robusta with usual shade for coffee.

Coffee arabica and coffee robusta are planted in between orange plants at a distance of 2·4 m. and 3·7 m. respectively.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 4. (v) One row around each treatment. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Aphids and leaf fall. Control measures taken. (iii) Girth, height and volume. (iv) (a) 1961—N.A. (b) N.A. (c) Nil. (v) No. (vi) and (vii) Nil.

5. RESULTS :

**61(187)**

(i) 6·2 cm./tree. (ii) 0·8 cm./tree. (iii) Treatment differences are not significant. (iv) Av. girth/tree in cm.

| Treatment | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|
| Av. girth | 6·2 | 6·2 | 6·3 |

**62(175)**

(i) 8·4 cm./tree. (ii) 1·1 cm./tree. (iii) Treatment differences are not significant. (iv) Av. girth/ tree in cm.

| Treatment | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|
| Av. girth | 8·4 | 8·5 | 8·2 |

**63(173)**

(i) 10·8 cm./tree. (ii) 1·1 cm./tree. (iii) Treatment differences are not significant. (iv) Av. girth/tree in cm.

| Treatment | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|
| Av. girth | 11·3 | 10·6 | 10·6 |

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**Crop :- Citrus.**
**Site :- Reg. Fruit Res. Stn., Chethally.**

**Ref :- Ms. 60(188), 61(186), 62(170), 63(172).**
**Type :- 'C'.**

Object :—To study the effect of mulching and providing shade on Mandarin.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Medium black. (iii) Seedlings. (iv) Coorg—mandarin. (v) Sept. 1956. (vi) One year. (vii) 0·7 Kg. of N in the form of organic manure+0·7 Kg. of $P_2O_5$+0·5 Kg. of $K_2O$/tree given in 3 instalments. (viii) As per treatments and plant protection operations done. (ix) Nil. (x) Unirrigated. (xi) 164 cm. ; 275 cm. ; 198 cm. (xii) Not started bearing in 1960 ; Oct. to March in other years.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of shade : $S_0$=No shade and $S_1$=Shade.
(2) 2 levels of mulching : $M_0$=No mulching and $M_1$=Mulching.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 4. (v) One guard row around each plot. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Aphids and leaf fall—control measures taken. (iii) Girth, height and volume measurements and fruits/tree. (iv) (a) 1960 to 63. (b) N.A. (c) Nil. (v) No. (vi) and (vii) Nil.

5. RESULTS :

**60(188)**

(i) 31·1 cm./tree. (ii) 2·8 cm./tree. (iii) None of the effects is significant. (iv) Av. girth/tree in cm.

| | $S_0$ | $S_1$ | Mean |
|---|---|---|---|
| $M_0$ | 31·4 | 31·5 | 31·4 |
| $M_1$ | 30·5 | 30·9 | 30·7 |
| Mean | 30·9 | 31·2 | 31·1 |

**61(186)**

(i) 99 fruits/tree. (ii) 40·0 fruits/tree. (iii) Interaction M×S is significant. (iv) Av. yield of fruits/tree in number.

| | $S_0$ | $S_1$ | Mean |
|---|---|---|---|
| $M_0$ | 63 | 152 | 108 |
| $M_1$ | 103 | 79 | 91 |
| Mean | 83 | 116 | 99 |

C.D. for the body of table=64·0 fruits/tree.

**62(170)**

(i) 204 fruits/tree. (ii) 142·0 fruits/tree. (iii) None of the effects is significant. (iv) Av. yield of fruits/tree in number.

| | $S_0$ | $S_1$ | Mean |
|---|---|---|---|
| $M_0$ | 202 | 280 | 241 |
| $M_1$ | 158 | 176 | 167 |
| Mean | 180 | 228 | 204 |

**63(172)**

(i) 117 fruits/tree. (ii) 61·2 fruits/tree. (iii) None of the effects is significant. (iv) Av. yield of fruits/tree in number.

| | $S_0$ | $S_1$ | Mean |
|---|---|---|---|
| $M_0$ | 105 | 76 | 90 |
| $M_1$ | 109 | 179 | 144 |
| Mean | 107 | 128 | 117 |

**Crop :- Citrus.** **Ref :- Ms. 62(248), 63(215), 64(181), 65(15).**

**Site :- Horticultural Farm, Gonicoppal.** **Type :- 'C'.**

Object :—To study the effect of different root stocks on Citrus.

## 1. BASAL CONDITIONS :

(i) Jungle. (ii) Black loam. (iii) Buddlings. (iv) Coorg—Orange. (v) June 1961 (6·6 m. between lines). (vi) 2 years after sowing. (vii) 113 gm. of N+22·7 gm. of $P_2O_5$+9·1 gm. of $K_2O$/plant in 1962 ; 182 gm. of N+90·8 gm. of $P_2O_5$+136 gm. of $K_2O$/tree in the form of organic and inorganic manures and 2·3 Kg. of dolomite was sprayed in 1963 ; 454 gm. of N+363 gm. of $P_2O_5$+363 gm. of $K_2O$ both in organic and inorganic form+4·4 Kg. of dolomite/tree spread uniformly in 1964 and 540 gm. of N+360 gm. of $P_2O_5$+590 gm. of $K_2O$ both in organic and inorganic form+6·8 Kg. of dolomite/tree spread uniformly in 1965. N, P and K applied in split doses during all the years. (viii) Weeding around the trees and mulching the beds and scrapping. (ix) Nil. (x) Unirrigated. (xi) 402 cm. ; 243 cm. ; 200 cm. and 152 cm. (xii) June for 1962 to 64 ; N.A.

## 2. TREATMENTS ;

11 sources of root stocks : $T_0$=Coorg mandarin seedlings C reticulata Blanco. (Control), $T_1$=Rubidoux—Poncirus trifoliate (California), $T_2$=Ponaeroy—P trifoliata (California), $T_3$=P—Trifoliata (Florida), $T_4$=P—Trifoliata (Australia), $T_5$=Troyer citrange—a hybrid (California), $T_6$=Cleopatra mandarin C. reticulata Blanco (California), $T_7$=Kinnow mandarin C. reticulata Blanco (Florida), $T_8$=Mexican key lime C. Curantifenia Swingle (Florida), $T_9$=West Indian mexican lime C. Curantifenia Swingle (California) and $T_{10}$=Kara mandarin C. reticulata Blanco (California).

## 3. DESIGN:

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 3 plants/plot. (v) One row of seedlings all round. (vi) Yes.

## 4. GENERAL :

(i) Fair. (ii) Hand picking of leaf eating catterpillars, control of aphids, mites etc. (iii) Height and girth. (iv) (a) 1962—N.A. (b) N.A. (c) Nil. (v) No. (vi) and (vii) Nil.

## 5. RESULTS :

Stock girth in cm./plant (mean of 3 plants).

**62(248)**

(i) 9·4 cm./plant. (ii) 1·5 cm./plant. (iii) Treatment differences are highly significant. (iv) Mean girth/plant in cm.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean girth | 7·0 | 8·6 | 9·4 | 9·3 | 13·8 | 9·2 | 9·9 | 8·9 | 10·5 | 7·3 | 9·8 |

C.D.=2·5 cm./plant.

**63(215)**

(i) 14·0 cm./plant. (ii) 2·4 cm./plant. (iii) Treatment differences are significant. (iv) Mean girth/plant in cm.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Meanh | 10·0 | 14·6 | 15·6 | 14·3 | 18·4 | 14·5 | 15·5 | 13·1 | 12·2 | 11·4 | 14·1 |

C.D.=4·0 cm./plant.

**64(181)**

(i) 17·9 cm./plant. (ii) 3·3 cm./plant. (iii) Treatment differences are not significant. (iv) Mean girth/plant in cm.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean girth | 12·7 | 18·9 | 21·1 | 18·4 | 22·3 | 18·5 | 19·9 | 18·4 | 14·9 | 14·6 | 16·8 |

**65(15)**

(i) 22·2 cm./plant. (ii) 4·7 cm./plant. (iii) Treatment differences are significant. (iv) Mean girth/plant in cm.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean girth | 15·8 | 23·7 | 27·2 | 22·5 | 27·9 | 23·1 | 26·3 | 24·2 | 16·5 | 17·2 | 20·1 |

C.D.=8·1 cm./plant.

Height in cm./plant (mean of 3 plants).

**62(248)**

(i) 1·2 m./plant. (ii) 0·2 m./plant. (iii) Treatment differences are significant. (iv) Mean height/plant in m.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean height | 1·2 | 1·0 | 1·1 | 1·1 | 1·5 | 1·1 | 1·3 | 1·1 | 1·2 | 0·8 | 1·4 |

C.D.=0.3 cm./plant.

**63(215)**

(i) 1·5 m./plant. (ii) 0·3 m./plant. (iii) Treatment differences are not significant. (iv) Mean height/plant in m.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean height | 1·4 | 1·5 | 1·5 | 1·5 | 1·6 | 1·5 | 1·7 | 1·4 | 1·3 | 1·2 | 1·7 |

**64(181)**

(i) 1·8 m./plant. (ii) 0·3 m./plant. (iii) Treatment differences are not significant. (iv) Mean height/plant. in m.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean height | 1·7 | 1·8 | 1·9 | 1·9 | 2·1 | 1·9 | 2·0 | 1·9 | 1·5 | 1·4 | 1·9 |

**65(15)**

(i) 2·1 m./plant. (ii) 0·5 m./plant. (iii) Treatment differences are not significant. (iv) Mean height/plant in m.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$ | $T_{10}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean height | 1·9 | 2·1 | 2·3 | 2·1 | 2·9 | 2·2 | 2·3 | 2·2 | 1·7 | 1·6 | 2·1 |

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**Crop :- Citrus.** **Ref :- Ms. 60(256), 61(247), 62(246), 63(213), 64(179), 65(13).**

**Site :- Horticultural Farm, Gonicoppal.** **Type :- 'C'.**

Object :—To study the influence of various root stocks.

1. BASAL CONDITIONS :

(i) Jungle. (ii) Black loam. (iii) Buddings. (iv) Coorg orange (Citrus reticulate). (v) August 1955 (6·1 m. between 2 plants). (vi) 2 years after sowing. (vii) 0·5 Kg./plant of N as C/A/N+0·3 Kg./plant of $P_2O_5$ as Super+0·3 Kg./plant of $K_2O$ as Mur. Pot.+41 Kg./plant of C.M. (viii) 4 weedings, scrapping, mulching, prunning and clean cultivation. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) November and February.

## 2. TREATMENTS :

8 varieties of root stocks : $T_1$=Mandarin (control), $T_2$=Lime, $T_3$=Buduvapali, $T_4$=Balladakithuli, $T_5$=Naicha kotha, $T_6$=Rough lemon, $T_7$=Sour orange and $T_8$= Khatta.

## 3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6 trees/plot. (v) Yes ; details N.A. (vi) Yes.

## 4. GENERAL :

(i) Fair. (ii) Aphids, mealy bug and stem borer—control measures taken ; details N.A. (iii) Height, girth and no. of fruits/tree. (iv) (a) 1955—indefinite. (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

**60(256)**

(i) 3·0 m./tree. (ii) 0·3 m./tree. (iii) Treatment differences are highly significant. (iv) Av. height in m./tree.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|
| Av. height | 3·2 | 2·6 | 3·1 | 3·1 | 3·0 | 3·3 | 2·4 | 3·1 |

C.D.=0·4 m./tree.

**61(247)**

(i) 75 fruits/tree. (ii) 41 fruits/tree. (iii) Treatment differences are highly significant. (iv) Av. no. of fruits/tree.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|
| Av. number | 7 | 77 | 118 | 30 | 100 | 49 | 62 | 154 |

C.D.=60 fruits/tree.

**62(246)**

(i) 242 fruits/tree. (ii) 103 fruits/tree. (iii) Treatment differences are highly significant. (iv) Av. no. of fruits/tree.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|
| Av. number | 66 | 171 | 446 | 308 | 252 | 277 | 85 | 331 |

C.D.=152 fruits/tree.

**63(213)**

(i) 800 fruits/tree. (ii) 254 fruits/tree. (iii) Treatment differences are not significant. (iv) Av. no. of fruits/tree.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|
| Av. number | 661 | 720 | 1087 | 978 | 678 | 903 | 514 | 860 |

C.D.=374 fruits/tree.

**64(179)**

(i) 581 fruits/tree. (ii) 186 fruits/tree. (iii) Treatment differences are highly significant. (iv) Av. no. of fruits/tree.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|
| Av. number | 459 | 311 | 773 | 1065 | 393 | 947 | 94 | 606 |

C.D.=274 fruits/tree.

65(13)

(i) 250 fruits/tree. (ii) 89 fruits/tree. (iii) Treatment differences are highly significant. (iv) Av. no. of fruits/tree.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|
| Av. number | 256 | 133 | 339 | 384 | 249 | 395 | 32 | 210 |

C.D.=131 fruits/tree.

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**Crop :- Citrus.** **Ref :- Ms. 60(258), 61(249), 62(249), 63(216),64(182),65(18).**

**Site :- Horticultural Farm, Gonicoppal.** **Type :- 'C'.**

Object :—To study the influence of different orchard practices.

1. BASAL CONDITIONS :

(i) Jungle. (ii) Black loam. (iii) Seedlings. (iv) Coorg Mandarin. (v) August 1955 (6·1 m. between 2 plants). (vi) One year. (vii) 454 gm. of N as C/A/N+290 gm. of $P_2O_5$ as Super+341 gm. of $K_2O$ as Mur. Pot+68 Kg. of C.M. per plant. (viii) 4 weedings, scrapping, mulching, prunning and clean cultivation. (ix) and (x) Nil. (xi) 266 cm. ; 285 cm. ; 402 cm. ; 243 cm. ; 200 cm. ; 152 cm. (xii) June 1960 ; June 1961 ; Nov. to Feb. for 62 to 65.

2. TREATMENTS :

5 cultural practices : $C_0$=Control, $C_1$=Providing soil mulch by hoeing, $C_2$=Mulching with dry leaves, $C_3$=Shading the plants on south-west direction and $C_4$=Spraying the ground with 2, 4—D to keep down the weeds.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 4 trees/plot. (v) One row of seedling around every plot. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Aphids. (iii) Girth, height and no. of fruits. (iv) (a) August 1955—indefinite. (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

| Treatments | Girth in cm./tree | | | | Height in m./tree | | | | Cholorosis % | Volume in cubic m./tree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1961 | 1962 | 1963 | 1960 | 1961 | 1962 | 1963 | 1961 | 1962 | 1963 |
| $C_0$ | 33·65 | 41·29 | 45·90 | 54·16 | 3·71 | 4·36 | 4·53 | 4·60 | 30·0 | 31·25 | 35·26 |
| $C_1$ | 35·02 | 42·58 | 48·32 | 56·03 | 3·58 | 4·25 | 4·60 | 4·66 | 31·0 | 33·94 | 36·79 |
| $C_2$ | 34·15 | 41·24 | 44·37 | 53·77 | 3·67 | 4·10 | 4·35 | 4·44 | 38·0 | 29·61 | 37·54 |
| $C_3$ | 32·36 | 39·54 | 43·99 | 52·10 | 3·64 | 3·96 | 4·33 | 4·36 | 31·0 | 28·34 | 31·49 |
| $C_4$ | 27·70 | 35·46 | 40·20 | 47·40 | 3·38 | 3·97 | 4·33 | 4·38 | 36·0 | 21·78 | 27·97 |
| G. M. | 32·57 | 40·02 | 44·56 | 52·69 | 3·59 | 4·13 | 4·42 | 4·49 | 33·0 | 28·98 | 33·81 |
| S.E./plot | 3·47 | 4·34 | 5·63 | 5·69 | 0·37 | 0·32 | 0·30 | 0·27 | 12·4 | 10·59 | 9·37 |
| Sig. | N.S. | N.S. | N.S. | N.S. | N.S. | N.S. | N.S. | N.S. | N.S. | N.S. | N.S. |

Fruits/tree.

62(249)

(i) 94 fruits/tree. (ii) 83 fruits/tree. (iii) Treatment differences are not significant. (iv) Av. number of fruits/tree.

| Treatment | $C_0$ | $C_1$ | $C_2$ | $C_3$ | $C_4$ |
|---|---|---|---|---|---|
| Av. number | 106 | 133 | 95 | 117 | 17 |

**63(216)**

(i) 482 fruits/tree. (ii) 187 fruits/tree. (iii) Treatment differences are not significant. (iv) Av. number of fruits/tree.

| Treatment | $C_0$ | $C_1$ | $C_2$ | $C_3$ | $C_4$ |
|---|---|---|---|---|---|
| Av. number | 574 | 497 | 508 | 453 | 380 |

**64(182)**

(i) 484 fruits/tree. (ii) 163 fruits/tree. (iii) Treatment differences are not significant. (iv) Av. number of fruits/tree.

| Treatment | $C_0$ | $C_1$ | $C_2$ | $C_3$ | $C_4$ |
|---|---|---|---|---|---|
| Av. number | 577 | 579 | 497 | 523 | 244 |

**65(18)**

(i) 732 fruits/tree. (ii) 322 fruits/tree. (iii) Treatment differences are not significant. (iv) Av. number of fruits/tree.

| Treatment | $C_0$ | $C_1$ | $C_2$ | $C_3$ | $C_4$ |
|---|---|---|---|---|---|
| Av. number | 811 | 839 | 895 | 817 | 299 |

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**Crop :- Citrus.**
**Ref :- Ms. 60(186), 61(184), 62(168), 63(174).**
**Site :- Reg. Fruit Res. Stn., Chethally.**
**Type :- 'IM'.**

Object :—To study the effect of irrigation with and without N on Orange.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Medium black. (iii) Seedlings. (iv) Coorg mandarin. (v) August 1954, 6 m.×6 m. (vi) One year. (vii) Nil. (viii) Plant protection operation done. (ix) Nil. (x) Irrigated. (xi) 163 cm.; 275 cm.; 198 cm.; 146 cm. (xii) Not started bearing for 1960 and 61; Oct. to March for 62 and 63.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 3 levels of irrigation : $I_0$=No irrigation, $I_1$=Once a week and $I_2$=Once in two weeks.
(2) 2 levels of N : $N_0$=0 and $N_1$=0·9 Kg./plant of N as A/S.
N applied in two instalments in August and May.
Irrigation 727 litres of water/tree from 4th week of January to 1st week of May.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 6. (b) N A. (iii) 4. (iv) (a) N.A. (b) 2. (v) One row around each plot. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Leaf fall and aphids affected. (iii) Girth and height measurements, yield of fruits per tree. (iv) (a) 1954-63. (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

**60(186)**

Girth

(i) 43·9 cm./tree. (ii) 5·3 cm./tree. (iii) I effect is highly significant. (iv) Av. girth in cm./tree.

| | $I_0$ | $I_1$ | $I_2$ | Mean |
|---|---|---|---|---|
| $N_0$ | 34·5 | 47·8 | 47·8 | 43·4 |
| $N_1$ | 40·8 | 48·2 | 44·5 | 44·5 |
| Mean | 37·6 | 48·0 | 46·2 | 43·9 |

C.D. for I marginal means=5·6 cm./tree.

61(184)

Girth

(i) 30·6 cm./tree. (ii) 17·4 cm./tree. (iii) None of the effects is significant. (iv) Av. girth in cm./tree.

| | $I_0$ | $I_1$ | $I_2$ | Mean |
|---|---|---|---|---|
| $N_0$ | 22·0 | 35·0 | 24·8 | 27·3 |
| $N_1$ | 45·0 | 33·0 | 24·0 | 34·0 |
| Mean | 33·5 | 34·0 | 24·4 | 30·6 |

**Fruits/tree**
**62(168)**

(i) 181 fruits/tree. (ii) 108 fruits/tree. (iii) None of the effects is significant. (iv) Av. number of fruits/tree.

| | $I_0$ | $I_1$ | $I_2$ | Mean |
|---|---|---|---|---|
| $N_0$ | 135 | 216 | 187 | 179 |
| $N_1$ | 291 | 134 | 123 | 183 |
| Mean | 213 | 175 | 155 | 181 |

**Fruits/tree**
**63(174)**

(i) 341 fruits/tree. (ii) 150 fruits/tree. (iii) Main effect of I is significant. (iv) Av. number of fruits/tree.

| | $I_0$ | $I_1$ | $I_2$ | Mean |
|---|---|---|---|---|
| $N_0$ | 154 | 441 | 467 | 354 |
| $N_1$ | 256 | 470 | 257 | 328 |
| Mean | 205 | 456 | 362 | 341 |

C.D. for I marginal means=160 fruits/tree.

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**Crop :- Citrus.** **Ref :- Ms. 60(259), 61(250), 64(183), 65(17).**

**Site :- Horticultural Farm, Gonicoppal.** **Type :- 'IC'.**

Object :— To study the effect of irrigation and micro-nutrients spray on Citrus.

1. BASAL CONDITIONS :

(i) Jungle. (ii) Black loam. (iii) Seedlings. (iv) Coorg mandarin. (v) August 1955 (6·1 m. between 2 plants). (vi) One year. (vii) 680 gm. of N as C/A/N+450 gm. of $P_2O_5$ as Super+340 gm. of $K_2O$ as Mur. Pot. (viii) Weeding around the trees, scrapping, mulching, prunning and clean cultivation. (ix) Nil. (x) As per treatments. (xi) 266 cm. ; 285 cm. ; 200 cm. ; 152 cm. (xii) Nov. to Feb. every year.

## 2. TREATMENTS :

**Main-plot treatments :**

3 levels of irrigation : $I_0$=No irrigation, $I_1$=Irrigation once in a week and $I_2$=Irrigation once in two weeks.

**Sub-plot treatments :**

8 micro-nutrients : $S_0$=Control (only water spray), $S_1$=Spray zinc as 2·27 Kg. as Zn. Sul.+1·14 Kg. of lime, $S_2$=Spray iron 2·27 Kg. as Fe. Sul.+1·14 Kg. of lime, $S_3$=Spray manganese 2·27 Kg. as Mn. Sul.+1·14 Kg. of lime, $S_4$=Spray 2·27 Kg. of Mg. Sul.+1·14 Kg. of lime, $S_5$=Spray 2·27 Kg. of Cu. Sul.+1·14 Kg. of lime, $S_6$=Spray 1·14 of boric acid and $S_7$=Spray of Ammo. Molybdate.

All the micro-nutrients sprayed twice during the year in 228 litres of water during the year 1960 to 1963 and 1965 and once during 1964.

Irrigation at the rate of 364, 364, 1365 and 1456 litres of water/tree was given during the years 1960, 1961, 1964 and 1965 respectively from Ist. March to 12th April.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/replication ; 8 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 2. (v) One guard row of seedlings. (vi) Yes.

## 4. GENERAL :

(i) Fair. (ii) Aphids, mealy bug and stem borer. Control measures taken. (iii) Chlorosis %, no. of fruits/plant. (iv) (a) 1955-contd. (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

**Chlorosis %**

**60(259)**

(i) 56·6 degrees. (ii) (a) 7·7 degrees. (b) 11·2 degrees. (iii) None of the effects is significant. (iv) Av. % of chlorosis (in degrees).

| | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | $S_7$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $I_0$ | 71·9 | 53·1 | 66·5 | 55·6 | 56·0 | 53·4 | 58·1 | 54·5 | 58·6 |
| $I_1$ | 48·8 | 60·4 | 63·7 | 56·4 | 61·0 | 51·4 | 66·0 | 59·1 | 58·3 |
| $I_2$ | 51·5 | 43·9 | 58·0 | 53·3 | 63·2 | 45·2 | 53·5 | 56·0 | 53·1 |
| Mean | 57·4 | 52·4 | 62·7 | 55·1 | 60·1 | 50·0 | 59·2 | 56·5 | 56·7 |

**61(250)**

(i) 44·6 degrees. (ii) (a) 8·9 degrees. (b) 9·4 degrees. (iii) I effect is significant. (iv) Av. % of chlorosis (in degrees).

| | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | $S_7$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $I_0$ | 49·5 | 29·5 | 51·5 | 40·5 | 35·1 | 30·2 | 39·0 | 34·9 | 38·8 |
| $I_1$ | 48·2 | 43·1 | 55·0 | 45·6 | 53·0 | 42·2 | 53·0 | 52·5 | 49·3 |
| $I_2$ | 47·6 | 36·3 | 52·6 | 45·6 | 54·6 | 32·0 | 45·6 | 51.0 | 45·7 |
| Mean | 48·4 | 36·3 | 53·0 | 43·9 | 47·6 | 35·5 | 45·9 | 46·1 | 44·6 |

C.D. for I marginal means=7·1 degrees.

**Fruits/tree**

**64(183)**

(i) 409 fruits/tree. (ii) (a) 409 fruits/tree. (b) 211 fruits/tree. (iii) None of the effects is significant. (iv) Av. number of fruits/tree.

| | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | $S_7$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $I_0$ | 259 | 312 | 440 | 397 | 699 | 372 | 654 | 264 | 425 |
| $I_1$ | 581 | 430 | 283 | 375 | 243 | 381 | 344 | 229 | 358 |
| $I_2$ | 524 | 404 | 246 | 485 | 573 | 577 | 338 | 405 | 444 |
| Mean | 455 | 382 | 323 | 419 | 505 | 444 | 445 | 299 | 409 |

65(17)

(i) 519 fruits/tree. (ii) (a) 380 fruits/tree. (b) 220 fruits/tree. (iii) None of the effects is significant. (iv) Av. yield of citrus is fruits/tree.

| | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ | $S_7$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $I_0$ | 551 | 686 | 521 | 755 | 699 | 510 | 1087 | 654 | 683 |
| $I_1$ | 516 | 365 | 291 | 485 | 381 | 515 | 396 | 393 | 418 |
| $I_2$ | 410 | 643 | 310 | 651 | 370 | 433 | 383 | 450 | 456 |
| Mean | 492 | 465 | 374 | 630 | 483 | 486 | 622 | 499 | 519 |

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**Crop :- Citrus.** **Ref :- Ms. 60(260), 61(251), 62(251), 63(218), 64(184), 65(16).**

**Site :- Horticultural Farm, Gonicoppal.** **Type :- 'D'.**

Object :— To find out whether multiple micronutrient spray has a salutary effect on growth and prevention of chlorosis of plants.

1. BASAL CONDITIONS :

(i) Jungle. (ii) Black loam. (iii) Seedlings. (iv) Coorg mandarin. (v) August 1957 (6·1 m. between plants). (vi) One year. (vii) 0·68 Kg. of N as C/A/N+0·45 Kg. of $P_2O_5$ as Super+0·34 Kg. of $K_2O$ as Mur. Pot. in two doses. (viii) Weeding, mulching and prunning. (ix) Nil. (x) Unirrigated. (xi) 266 cm. 285 cm ; 402 cm ; 243 cm ; 200 cm and 142 cm. (xii) June-July 1960 ; May 1961 ; N.A. for others.

2. TREATMENTS :

9 multiple micro-nutrient sprays : $T_0$=Control (no micro-nutrients), $T_1$=All micro-nutrients, $T_2$=All but Zn. $T_3$=All but Mn., $T_4$=All but Mg. $T_5$=All but Mo, $T_6$=All but B, $T_7$=All but Cu. and $T_8$=All but Fe.

All the trees receiving Zn. were sprayed with Zn. on one day and the next day all those receiving Mn, when sprayed with Mn. and so on. This was to prevent any effect of selective absorption bythe leaves and to avoid any autagenistic action of any element from a mixture of these elements in one spray. The spraying was done once during the year.

Doses of different micro-nutrients are—Zn. is 2·25 Kg. of Zn. Sul.+1·13 Kg. hydrated lime in 227·3 litres of water, Mn. is 1·35 Kg. of Mn. Sul. in 454·6 litres of water, Mg. is 0·9 Kg. of Mg. Sul. in 454·6 litres of water, Mo is 28·4 gm. of Sodium molybdate in 454·6 litres of water, B is 0·45 Kg. of Borax in 454·6 litres of water, Cu. is 3·6 Kg. of Cu. Sul.+3·6 Kg. of hydrated lime in 454·6 litres of water and Fe. is 0·9 Kg. of Fe. Sul. in 454·6 litres of water.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 4 trees/plot. (v) One guard row. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Girth, height, volume, % of chlorosis and fruits/plant. (iv) (a) 1957-N.A. (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS:

**Av. girth in cm.**

Treatment

| Year | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | G.m. | S.E./plot | Significance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 15·6 | 19·7 | 18·0 | 18·1 | 17·1 | 19·2 | 19·2 | 17·9 | 17·7 | 18·1 | 2·27 | N.S. |
| 1961 | 21·0 | 26·6 | 24·9 | 23·7 | 22·4 | 25·9 | 26·3 | 23·7 | 24·3 | 24·3 | 3·36 | N.S. |
| 1962 | 23·6 | 29·7 | 26·0 | 26·8 | 25·8 | 29·2 | 30·5 | 27·0 | 28·0 | 27·4 | 4·07 | N.S. |
| 1963 | 26·5 | 34·5 | 31·0 | 31·0 | 30·5 | 34·5 | 34·8 | 30·8 | 32·8 | 31·8 | 4·46 | N.S. |
| 1964 | 30·7 | 38·7 | 36·3 | 37·2 | 36·5 | 37·6 | 39·3 | 35·0 | 36·1 | 36·4 | 3·85 | N.S. |

**Height in metres**

Treatment

| Year | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | G.M. | S.E./plot | Significance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 2·4 | 2·7 | 2·5 | 2·5 | 2·4 | 2·9 | 2·8 | 2·7 | 2·7 | 2·6 | 0·23 | N.S. |
| 1961 | 2·4 | 3·1 | 3·0 | 2·9 | 2·8 | 3·2 | 3·1 | 3·1 | 3·0 | 2·9 | 0·25 | N.S. |
| 1962 | 3·0 | 3·4 | 3·1 | 3·2 | 3·0 | 3·4 | 3·4 | 3·3 | 3·3 | 3·2 | 0·27 | N.S. |
| 1963 | 3·4 | 3·7 | 3·7 | 3·5 | 3·6 | 3·8 | 3·8 | 3·7 | 3·6 | 3·6 | 0·25 | N.S. |
| 1964 | 3·6 | 3·8 | 3·9 | 3·9 | 3·8 | 4·0 | 4·0 | 4·0 | 3·7 | 3·9 | 0·20 | N.S. |

**Volume in Cubic metres**

Treatment

| Year | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | G.M. | S.E./plot | Significance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 2·5 | 3·9 | 3·3 | 2·8 | 2·6 | 3·4 | 3·6 | 3·4 | 3·1 | 3·2 | 0·70 | N.S. |
| 1961 | 3·7 | 7·5 | 6·0 | 5·9 | 5·1 | 7·8 | 6·8 | 5·7 | 6·0 | 6·1 | 1·68 | N.S. |
| 1962 | 6·3 | 11·5 | 7·9 | 8·7 | 7·3 | 10·7 | 14·3 | 8·9 | 10·0 | 9·5 | 3·72 | N.S. |
| 1963 | 8·8 | 15·1 | 12·3 | 12·6 | 13·0 | 16·9 | 17·3 | 13·1 | 15·0 | 13·8 | 3·30 | N.S. |
| 1964 | 10·7 | 16·2 | 15·4 | 15·4 | 16·1 | 18·1 | 17·7 | 15·6 | 16·0 | 15·7 | 3·21 | N.S. |

**Chlorosis %**

Treatment

| Year | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | G.M. | S.E./plot | Significance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 76·0 | 33·0 | 44·0 | 46·0 | 51·0 | 45·0 | 38·0 | 51·0 | 42·0 | 47·4 | 19·30 | N.S. |
| 1961 | 66·0 | 29·0 | 49·0 | 48·0 | 53·0 | 36·0 | 29·0 | 50·0 | 42·0 | 44·6 | 10·77 | * |
| 1962 | 78·0 | 37·0 | 59·0 | 56·0 | 54·0 | 47·0 | 42·0 | 56·0 | 48·0 | 52·9 | 14·20 | N.S. |
| 1963 | 82·3 | 61·3 | 72·3 | 80·7 | 62·0 | 67·3 | 55·0 | 58·0 | 72·0 | 67·9 | 7·95 | * * |
| 1964 | 66·0 | 34·7 | 57·3 | 46·0 | 41·3 | 39·7 | 37·3 | 41·0 | 48·0 | 45·7 | 8·33 | * * |

**Av. number of fruits/tree**

Treatment

| Year | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | G.M. | S.E./plot | Significance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1964 | 52 | 85 | 63 | 36 | 55 | 52 | 59 | 56 | 52 | 57 | 45·3 | N.S. |
| 1965 | 77 | 174 | 174 | 107 | 114 | 123 | 230 | 170 | 120 | 143 | 54·0 | N.S. |

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**Crop :- Coffee.** **Ref :- Ms. 62(196), 62(194), 62(195), 62(191), 62(192).**

**Site :- Central Coffee Res. Instt. Balehonnur.** **Type :- 'M'.**

Object :— To study the effect of N alone and in combination with P and K in various soil and climatic regions growing Coffee.

1. BASAL CONDITIONS :

(i) and (ii) N.A. (iii) Seedlings. (iv) to (vi) N.A. (vii) 67·2 Kg/ha. of N applied in 3 doses. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) 328 cm. (xii) N.A.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 2 levels of $P_2O_5$ : $P_0=0$ and $P_1=33·6$ Kg/ha.
(2) 2 levels of $K_2O$ : $K_0=0$ and $K_1=44·8$ Kg/ha.
P and K applied in 2 doses.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6 for 62(196), 62(194), 62(195), 5 for 62(191), 62(192). (iv) (a) and (b) N.A. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to good. (ii) Nil. (iii) Yield of ripe cherry. (iv) (a) 1961-contd. (b) N.A. (c) Nil. (v) Experiments conducted at Nilgiri zone, Yercand zone, Pulneys zone, South coorg and Wynad zone, Koopa zone respectively. (vi) and (vii) Nil.

5. RESULTS :

**Nilgiri Zone 62(196)**

(i) 4700 Kg/ha. (ii) 822·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of ripe cherry in Kg/ha.

| | $K_0$ | $K_1$ | Mean |
|---|---|---|---|
| $P_0$ | 4370 | 4436 | 4403 |
| $P_1$ | 4950 | 5043 | 4996 |
| Mean | 4460 | 4739 | 4700 |

**Yercand Zone 62(194).**

(i) 2516 Kg/ha. (ii) 569·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of ripe cherry in Kg/ha.

| | $K_0$ | $K_1$ | Mean |
|---|---|---|---|
| $P_0$ | 2377 | 2409 | 2393 |
| $P_1$ | 2615 | 2665 | 2640 |
| Mean | 2496 | 2537 | 2516 |

**Pulneys Zone 62(195)**

(i) 3167 Kg/ha. (ii) 629·3 Kg/ha. (iii) None of the effects is significant, (iv) Av. yield of ripe cherry in Kg/ha.

| | $K_0$ | $K_1$ | Mean |
|---|---|---|---|
| $P_0$ | 3407 | 2905 | 3156 |
| $P_1$ | 3061 | 3294 | 3177 |
| Mean | 3234 | 3100 | 3167 |

**South coorg and Wynad Zone 62(191)**

(i) 6594 Kg/ha. (ii) 1123·8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of ripe cherry in Kg/ha.

| | $K_0$ | $K_1$ | Mean |
|---|---|---|---|
| $P_0$ | 7134 | 6372 | 6753 |
| $P_1$ | 6324 | 6548 | 6436 |
| Mean | 6729 | 6460 | 6594 |

**Koppa Zone 62(192)**

(i) 4845 Kg/ha. (ii) 828·2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of ripe cherry in Kg/ha.

| | $K_0$ | $K_1$ | Mean |
|---|---|---|---|
| $P_0$ | 4758 | 4931 | 4844 |
| $P_1$ | 5348 | 4342 | 4845 |
| Mean | 5053 | 4636 | 4844 |

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**Crop :- Coffee.** **Ref :- Ms. 60(31).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'M'.**

Object :— To find the effect of applying N alone and in combination with varying doses of P and K.

1. BASAL CONDITIONS :

(i) All the Coffee plants and shade trees were uprooted and removed from site Plants were raised from suckers obtained from S·46, B. A.B., B.A. 17 and B.A. 22—which were resistant to leaf disease. Dry leaf mulch was applied uniformly for production during hot weather. (ii) Reddish loams. (iii) and (iv) As in (i). (v) April 1953 with 183 cm. × 183 cm. spacing. (vi) 8 months. (vii) Nil. (viii) Manuring, weeding, handling to shade. (ix) Nil. (x) Irrigated. (xi) 301 cm. (xii) Nov. to Dec.

2. TREATMENTS :

All combinations of (1) and (2)+2 extra treatments.

(1) 2 levels of $P_2O_5$ : $P_1=33·6$ and $P_2=50·4$ Kg/ha.

(2) 2 levels of $K_2O$ : $K_1=44·8$ and $K_2=67·2$ Kg/ha.

Extra treatments : $E_0$=Control and $E_1=89·7$ Kg/ha. of N.

89·7 Kg/ha. of N applied to all PK treatments.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) Gross 35 and net 15 plants. (v) One border row around each plot and the general guard row around the whole experimental plot. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Gammaxene applied against borer attack. (iii) Yield of ripe cherry and clean Coffee. (iv) (a) 1954-N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2205 Kg/ha. (ii) 122·2 Kg/ha. (iii) All the effects are highly significant. (iv) Av. yield of Coffee in Kg/ha.

$E_0$=1944 Kg/ha. and $E_1$=2313 Kg/ha.

| | $K_1$ | $K_2$ | Mean |
|---|---|---|---|
| $P_1$ | 2473 | 2395 | 2434 |
| $P_2$ | 1229 | 2874 | 2052 |
| Mean | 1851 | 2635 | 2243 |

C.D. for any marginal means=130·2 Kg/ha.
C.D. for body of table =184·1 Kg/ha.

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**Crop :- Coffee.** **Ref :- Ms. 60(32).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'M'.**

Object :— To find out the maximum economic dose of N and the role of P and K in balancing the N utilization.

1. BASAL CONDITIONS :

(i) Coffee plants were 40 years old. Bulk manuring at 95·3 kg/ha. of N+44·8 Kg/ha of $P_2O_5$ and 67·2 kg/ha. of $K_2O$ was being given before the experiment was started. (ii) Reddish clayey loam. (iii) By seedlings. (iv) Coorg Arabica. (v) N. A. ; 152 cm. × 152 cm. (vi) 8 months. (vii) As per treatments. (viii) Shade loping, weeding and handling the plants. (ix) No. (x) Irrigated. (xi) 301 cm. (xii) Nov. and Dec.

2. TREATMENTS :

**Main-plot treatments :**

6 manurial treatments : $M_0$=Control, $M_1$=56·0 Kg/ha. of N+44·8 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$, $M_2$=112·1 kg/ha. of N+50·4 Kg/ha. of $P_2O_5$+67·2 Kg/ha. of $K_2O$, $M_3$= 224·2 Kg/ha. of N+100·9 Kg/ha. of $P_2O_5$+134·5 Kg/ha. of $K_2O$, $M_4$=448·3 Kg/ha. of N+201·8 Kg/ha. of $P_2O_5$+269·0 Kg/ha. of $K_2O$ and $M_5$=896·7 Kg/ha. of N+403·5 Kg/ha. of $P_2O_5$+538·0 Kg/ha. of $K_2O$.

**Sub-plot treatments :**

4 applications : $T_1$=N with $P_2O_5$ and $K_2O$, $T_2$=$T_1$+basal dressing of 1 kg./ha. of finely ground rock phosphate/plant applied at the commencement of the experiment, $T_3$=N only+basal dressing of rock phospate applied as above and $T_4$=N only.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 45 plots in a net sub-plot with common border in between adjacent sub-plots in strips of 3 rows of 15 plants splitting 4th, 8th and 12th respectively for the sub treatments. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Spraying with bordeaux mixture against leaf disease and application of gammaxene to the stems was done against borer attack during the season. (iii) Yield of fresh cherry and clean coffee. (iv) (a) 1956—N A. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 2521 kg./ha. (ii) (a) 1237·4 kg/ha. (b) 1240·8 kg/ha. (iii) None of the effects is significant. (iv) Av. dyiel of coffee in Kg/ha.

| | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | Mean |
|---|---|---|---|---|---|---|---|
| $T_1$ | 2264 | 3384 | 2459 | 2279 | 2901 | 4000 | 2881 |
| $T_2$ | 2126 | 2264 | 2604 | 2683 | 1960 | 2149 | 2298 |
| $T_3$ | 2394 | 2930 | 3870 | 2438 | 1330 | 2459 | 2570 |
| $T_4$ | 1678 | 2771 | 2503 | 1772 | 2560 | 2734 | 2326 |
| Mean | 2116 | 2837 | 2859 | 2293 | 2188 | 2836 | 2521 |

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**Crop. :- Coffee.** **Ref :- Ms. 60(27).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'M'.**

Object: —To study the effect of varying doses of N with constant levels of P and K on the growth of Coffee.

1. BASAL CONDITIONS :

(i) Old coffee was cut and removed. Natural shade is provided by planting the same number of *dadap* stakes. Drains 46 cm. deep have been dug. Liming done after finding out its requirements. Dry leaf mulch was uniformly applied during hot weather. (ii) Reddish loams. (iii) By cuttings and seedlings. (iv) Kent cloves. (v) 1952 with 183 cm. × 183 cm. as spacing. (vi) 8 months. (vii) Liming was done. 33·6 Kg/ha. of $P_2O_5$ and 44·8 kg./ha. of $K_2O$. (viii) Spraying, manuring, weeding and handling. (ix) Nil. (x) Irrigated (xi) 301 cm. (xii) Oct. to Dec.

2. TREATMENTS :

5 levels of N : $N_0=0$, $N_1=44·8$, $N_2=67·2$, $N_3=89·7$ and $N_4=112·1$ Kg/ha.
Manures applied in 4 doses at pre-blossom, post blossom, pre-monsoon and post monsoon stages.

3. DESIGN :

(i) L. sq. (ii) (a) 5. (b) N. A. (iii) 5. (iv) (a) N. A. (b) Gross 49 plants ; net 25 plants. (v) 24 plants. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Gammaxene application was done to prevent stem borer attack. (iii) Yield of ripe cherry and clean coffee. (iv) (a) 1952—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 4172 Kg/ha. (ii) 1163·1 Kg/ha. (iii) Treatments differences are not significant. (iv) Av. yield of cherry in Kg/ha.

| Treatment | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $N_4$ |
|---|---|---|---|---|---|
| Av. yield | 4599 | 4266 | 3176 | 4476 | 4341 |

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**Crop :- Coffee.** **Ref :- Ms. 60(236), 61(232), 62(231), 63(205).**

**Site :- Central Coffee Res. Instt.,**
**Balehonnur.** **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Coffee.

1. BASAL CONDITIONS :

(i) Forest. (ii) N.A. (iii) Seedlings. (iv) Robusta. (v) Old coffee garden. (vi) N.A. (vii) Nil. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) More than 254 cm. approximately. (xii) December to March.

2. TREATMENTS :

6 manurial treatments : $M_1$=44·8 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$, $M_2$=67·3 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$, $M_3$=67·3 Kg/ha. of N+50·4 Kg/ha. of $P_2O_5$+67·3 Kg/ha. of $K_2O$, $M_4$=89·7 Kg/ha. of N+67·3 Kg/ha. of $P_2O_5$+89·7 Kg/ha. of $K_2O$, $M_5$=67·3 Kg/ha. of N+67·3 Kg/ha. of $P_2O_5$+89·7 Kg/ha. of $K_2O$ and $M_6$=44·8 Kg/ha. of N+67·3 of $P_2O_5$+89·7 Kg/ha. of $K_2O$.

N applied as A/S in three doses at pre-blossom, post blossom and at post monsoon periods. P and K applied as phosphoric acid and Potash respectively in two equal doses during pre-blossom and post monsoon periods.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 20 (5×4). (v) One row around each plot. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Ripe cherry. (iv) (a) 1956 to 1963. (b) N.A. (c) Nil. (v) and (vi) Nil. (vii) Expt. conducted at Panchura estate, Kelpetta Wynad.

5. RESULTS :

**60(236)**

(i) 3309 Kg/ha. (ii) 436·4 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 3632 | 3692 | 2784 | 3147 | 2966 | 3632 |

C.D.=575·6 Kg/ha.

**61(232)**

(i) 3561 Kg/ha. (ii) 275·3 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 3487 | 3276 | 3527 | 4150 | 3558 | 3367 |

C.D.=363·1 Kg/ha.

**62(231)**

(i) 4981 Kg/ha. (ii) 370·1 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 4802 | 4649 | 4954 | 5526 | 5297 | 4657 |

C.D.=488·2 Kg/ha.

**63(205)**

(i) 8335 Kg/ha. (ii) 498·4 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 8371 | 7444 | 8333 | 8587 | 8892 | 8384 |

C.D.=657·4 Kg/ha.

**Crop :- Coffee.** **Ref :- 60(233), 61(229), 62 228), 63(203).**

**Site :- Central Coffee Res. Instt , Balehonnur.** **Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Coffee.

1. BASAL CONDITIONS :

(i) Forest. (ii) N.A. (iii) Seedlings. (iv) Robusta. (v) Old Coffee plants. (vi) N.A. (vii) Nil. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) 299 cm ; 361 cm. ; 328 cm. and 250 cm. (xii) December to March.

2. TREATMENTS to 4 GENERAL :

Same as in Expt. nos. 60(236), 61(232), 62(231), 63(205) on page 555.
(Expt. was conducted at Yemmengudi estate—South Coorg.

5. RESULTS :

60(233)

(i) 1591 Kg/ha. (ii) 346·7 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 779 | 2591 | 1677 | 1753 | 1448 | 1296 |

C.D.=457·3 Kg/ha.

61(229)

(i) 5245 Kg/ha. (ii) 349·8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 5534 | 5351 | 5053 | 5183 | 5053 | 5297 |

62(228)

(i) 2705 Kg/ha. (ii) 175·0 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 3078 | 2616 | 2782 | 2904 | 2347 | 2485 |

C.D.=230·8 Kg/ha.

63(203)

(i) 9500 Kg/ha. (ii) 1555·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 11100 | 9348 | 9054 | 9278 | 9054 | 9166 |

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**Crop :- Coffee.** **Ref :- Ms. 60(234), 61(230), 62(229), 63(204).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'M'.**

Object : To study the effect of N, P and K on the yield of Coffee.

1. BASAL CONDITIONS :

(i) Forest. (ii) N. A. (iii) Seedlings. (iv) Robusta. (v) Old coffee plants. (vi) N.A. (vii) Nil. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) 299 cm. ; 361 cm. ; 328 cm. ; 250 cm. (xii) December to March.

2. TREATMENTS to 4. GENERAL :

Same as in expt. nos. 60(236), 61(232), 62(231), 63(205) on page 555.
Expt. conducted at Havinkadu estate, South Coorg.

5. RSSULTS :

60(234)

(i) 3392 Kg/ha. (ii) 451·1 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 3658 | 3354 | 3354 | 2744 | 4039 | 3201 |

C.D.=595·0 Kg/ha.

61(230)

(i) 5782 Kg/ha. (ii) 415·1 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 5856 | 6376 | 6224 | 5513 | 5450 | 5271 |

C.D.=547·5 Kg/ha.

62(229)

(i) 3229 Kg/ha. (ii) 123·0 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 4040 | 3544 | 2210 | 3628 | 2942 | 3011 |

C.D.=162·2 Kg/ha.

63(204)

(i) 2036 Kg/ha. (ii) 347·1 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 1907 | 2479 | 1780 | 2289 | 2161 | 1602 |

C.D.=457·8 Kg/ha.

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**Crop :- Coffee.** **Ref :- 60 (237), 61(233), 62(232).**

**Site :- Central Coffee Res. Instt., Balehonnur. Type :- 'M'.**

Object :—To study the effect of N, P and K on the yield of Coffee.

1. BASAL CONDITIONS :

(i) Forest. (ii) N.A. (iii) Seedlings. (iv) Robusta. (v) Old plantation. (vi) and (vii) N.A. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) More than 254 cm. approximately; N.A. for others. (xii) December to March.

2. TREATMENTS :

As in expt. nos. 60(236), 61(232), 62(231), 63(205) on page 555.
Expt. conducted at Maniangoda estate, Wynad.

5. RESULTS

60(237)

(i) 2816 Kg/ha. (ii) 218·5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 2603 | 2542 | 3208 | 2614 | 3208 | 2724 |

C.D.=288·2 Kg/ha.

61(233)

(i) 7517 Kg/ha. (ii) 935·8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 7757 | 8414 | 7031 | 6890 | 7414 | 7596 |

62(232)

(i) 3912 Kg/ha. (ii) 307·9 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 3582 | 3963 | 4039 | 4573 | 3430 | 3887 |

C.D.=406·1 Kg/ha.

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**Crop :- Coffee.** **Ref :- Ms. 60(235), 61(231), 62(230).**

**Site :- Contral Coffee Res. Instt., Balehonnur.** **Type :- 'M'.**

Object : –To study the effect of N, P and K on the yield of Coffee.

1. BASAL CONDITIONS :

(i) Forest. (ii) N.A. (iii) Seedlings. (iv) Robusta. (v) Old plantation. (vi) N.A. (vii) Nil. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) 299 cm.; 361 cm.; 328 cm. (xii) December to March.

2. TREATMENTS & 3. DESIGN :

Same as in expt. nos. 60(236), 61(232), 62(231), 63(205) on page 555.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Ripe cherry (iv) (a) 1956—1962. (b) N.A. (c) Nil.. (v) N.A. (vi) Nil. (vii) Expt. conducted at Bankel estate, Mudegere.

5. RESULTS :

60(235)

(i) 5939 Kg/ha. (ii) 411 Kg/ha. (iii) Treatments differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield. | 6653 | 4954 | 5297 | 5869 | 6331 | 6532 |

C.D.=542·1 Kg/ha.

**61(231)**

(i) 5035 Kg/ha. (ii) 447·5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 5462 | 4942 | 4484 | 4370 | 5209 | 5742 |

C.D.=590·2 Kg/ha.

**62(230)**

(i) 1742 Kg/ha. (ii) 298·0 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 1783 | 2172 | 1608 | 1601 | 1601 | 1684 |

C.D.=393·1 Kg/ha.

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**Crop :- Coffee.**
**Site :- Central Coffee Res. Instt., Balehonnur.**
**Ref :- Ms. 60(243), 61(240), 62(238), 63(207).**
**Type :- 'M'.**

Object :—To study the effect of different manures on the yield of Coffee.

1. BASAL CONDITIONS :

(i) Forest. (ii) N.A. (iii) Seedlings. (iv) Robusta. (v) Old plantation. (vi) N.A. (vii) B.D. of finely ground lime stone applied, broadcast and stirred with the top soil soon after marking out the plots. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Dec. and March.

2. TREATMENTS :

6 manurial treatments : $M_0$=Control (no manure), $M_1$=67·3 Kg/ha. of N, $M_2$=67·3 Kg/ha. of N+50·4 Kg/ha. of $P_2O_5$, $M_3$=67·3 Kg/ha. of N+67·3 Kg/ha. of $K_2O$, $M_4$=50·4 Kg/ha. of $P_2O_5$+67·3 Kg/ha. of $K_2O$ and $M_5$=67·3 Kg/ha. of N+50·4 Kg/ha. of $P_2O_5$+67·3 Kg/ha. of $K_2O$.

N applied as A/S in three doses during pre-blossom, post blosom and post monsoon periods. $P_2O_5$ and $K_2O$ as Hyper phos. and Mur. Pot. respectively applied in two equal doses during pre-blossom and post monsoon periods.

3. DESIGN :

(i) L. Sq. (ii) (a) 6., (b) N.A. (iii) 6. (iv) (a) N.A. (b) 20. (v) One row around each plot. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Ripe cherry (iv) (a) 1956 to 63. (b) N.A. (c) Nil. (v) Bankal estate. (vi) Nil. (vii) Expt. conducted at Punchura estate, Kalpetta, Wynad.

5. RESULTS :

**60(243)**

(i) 2862 Kg/ha. (ii) 200·9 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1828 | 3347 | 2802 | 2887 | 3311 | 2996 |

C.D.=242·0 Kg/ha.

**61(240)**

(i) 2856 Kg/ha. (ii) 242·2 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 2613 | 2553 | 2825 | 3076 | 3195 | 2875 |

C.D.=291·7 Kg/ha.

**62(238)**

(i) 3786 Kg/ha. (ii) 165·8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 3285 | 3620 | 3781 | 4390 | 3887 | 4954 |

C.D.=199·7 Kg/ha.

**63(207)**

(i) 6338 Kg/ha. (ii) 704·8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 7401 | 5861 | 5457 | 6379 | 6372 | 6562 |

C.D.=848·9 Kg/ha.

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**Crop :- Coffee.** **Ref :- Ms. 60(241), 61(238), 62(236).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'M'.**

Object :—To study the effect of different manures on the yield of Coffee.

1. BASAL CONDITONS to 3. DESIGN :

Same as in experiment no. 60(243), 61(240), 62(238), 63(207) on Coffee crop on page 560.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of ripe cherry. (iv) (a) 1956 to 62. (b) N.A. (c) Nil. (v) N.A. (vi) Nil. (vii) Experiment conducted at Bankal estate, Mudegere.

5. RESULTS :

**60(241)**

(i) 4141 Kg/ha. (ii) 397·1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 4192 | 4268 | 4497 | 4116 | 3735 | 4039 |

**61(238)**

(i) 3008 Kg/ha. (ii) 379·3 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 3049 | 2718 | 3417 | 3151 | 2439 | 3277 |

C.D.=456·8 Kg/ha.

**62(236)**

(i) 4341 Kg/ha. (ii) 710·4 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 3941 | 4039 | 4497 | 3963 | 4116 | 5488 |

C.D.=855·6 Kg/ha.

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**Crop :- Coffee.** **Ref :- Ms. 60(242), 61(239), 62(237).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'M'.**

Object :—To study the effect of different manures on the yield of Coffee.

1. BASAL CONDITIONS : to 3. DESIGN :

Same as in experiment no. 60(243), 61(240), 62(238), 63(207) on Coffee crop on page 560.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of ripe cherry. (iv) (a) 1956 to 62. (b) N.A. (c) Nil. (v) Nil. (vi) N.A. (vii) Expts. conducted at Maniangod estate, Kelpetta, Wynad.

5. RESULTS:

**60(242)**

(i) 2442 Kg/ha. (ii) 201·2 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1495 | 2766 | 2814 | 2222 | 2615 | 2742 |

C.D.=242·3 Kg/ha.

**61(239)**

(i) 6274 Kg/ha. (ii) 624·3 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 3813 | 5508 | 7505 | 6759 | 6819 | 7243 |

C.D.=751·9 Kg/ha.

**62(237)**

(i) 3691 Kg/ha. (ii) 315·2 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 3582 | 3300 | 4062 | 4116 | 3582 | 3506 |

C.D.=379·6 Kg/ha.

**Crop :- Coffee.**
**Site :- Central Coffee Res. Instt., Balehonnur.**

**Ref :- Ms. 60(232), 61(228), 62(227), 63(202).**
**Type :- 'M'.**

Object :—To study the effect of different sources of N on the growth and yield of mature Coffee.

1. BASAL CONDITIONS :

(i) Forest. (ii) Reddish brown. (iii) Seedlings. (iv) Coorg. (v) Old Coffee (15 cm.×15 cm.). (vi) N.A. (vii) 50·4 Kg/ha. of $P_2O_5$ applied in 2 equal doses and 67·3 Kg/ha. of $K_2O$ in 2 doses. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) 299 cm ; 361 cm ; 328 cm ; 250 cm. (xii) Dec. to March.

2. TREATMENTS :

6 sources of 89·7 Kg/ha. of N : $M_0$=Control (no manure), $M_1$=C/A/N, $M_2$=A/S, $M_3$=Urea, $M_4$=C/N and $M_5$=A/S/N.

N applied in 3 doses in a year.

3. DESIGN :

(i) L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 5×8=40 net. (v) Yes, one row around. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of ripe cherry. (iv) (a) 1956 to 63. (b) N.A. (c) Nil. (v) N.A. (vi) Nil. (vii) Experiment conducted at Shigode estate.

5. RESULTS :

60(232)

(i) 3053 Kg/ha. (ii) 337·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 2941 | 3073 | 3111 | 3428 | 2864 | 2901 |

61(228)

(i) 3005 Kg/ha. (ii) 146·2 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 2716 | 2613 | 2892 | 4027 | 2740 | 3044 |

C.D.=176·0 Kg/ha.

62(227)

(i) 3404 Kg/ha. (ii) 292·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 3671 | 3007 | 3886 | 3514 | 3339 | 3007 |

63(202)

(i) 3657 Kg/ha. (ii) 319·2 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 3872 | 2641 | 4048 | 4065 | 3918 | 3400 |

C.D.=384·4 Kg/ha.

**Crop :- Coffee.** **Ref :- Ms. 60(201), 61(206), 62(188), 63(184), 64(144).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'M'.**

Object :—To study the effect of constant levels of N, P and K with varying sources of N.

1. BASAL CONDITIONS :

(i) Under tea prior to 1937. (ii) Reddish brown to dark red. (iii) Seedlings. (iv) Arabica. (v) Planted in 1953 with natural mixed shade (1·8 m.×1·8 m.). (vi) N.A. (vii) Nil. (viii) Weeding, digging and interculturing. (ix) Nil. (x) Irrigated. (xi) 299 cm ; 361 cm ; 328 cm ; 250 cm ; 281 cm. (xii) Oct. to Dec.

2. TREATMENTS :

5 sources of N : $S_0$=Control (no manure), $S_1$=C/N, $S_2$=A/S, $S_3$=C/A/N and $S_4$=Urea.
89·7 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$ applied annually.
N applied in 3 doses—pre-blossom 22·4 Kg/ha., post-blossom 22·4 Kg/ha. and post monsoon 44·8 Kg/ha ; P and K applied in two equal doses at pre-blossom and post-blossom.

3. DESIGN :

(i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 20 net. (v) One row around each plot. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of ripe cherry. (iv) (a) 1960—contd. (b) N.A. (c) Nil (v) Not known. (vi) and (vii) Nil.

5. RESULTS :

**60(201)**

(i) 1582 Kg/ha. (ii) 438·6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ |
|---|---|---|---|---|---|
| Av. yield | 867 | 1977 | 2845 | 1015 | 1204 |

C.D.=604·4 Kg/ha.

**61(206)**

(i) 5087 Kg/ha. (ii) 496·5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ |
|---|---|---|---|---|---|
| Av. yield | 5230 | 3268 | 5341 | 5354 | 6242 |

C.D.=684·1 Kg/ha.

**62(188)**

(i) 6104 Kg/ha. (ii) 859·4 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ |
|---|---|---|---|---|---|
| Av. yield | 5760 | 5203 | 7228 | 6590 | 5740 |

C.D.=1184·1 Kg/ha.

**63(184)**

(i) 1569 Kg/ha. (ii) 567·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ |
|---|---|---|---|---|---|
| Av. yield | 1345 | 1196 | 1540 | 1524 | 2242 |

64(144)

(i) 6553 Kg/ha. (ii) 1739·0 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $S_0$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ |
|---|---|---|---|---|---|
| Av. yield | 4560 | 5412 | 8065 | 8051 | 6675 |

C.D.=2396·2 Kg/ha.

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**Crope :- Coffee.** **Ref :- Ms. 60(248), 61(245), 62(245), 63(210), 64(169).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'M'.**

Object :—To study the effect of N, P and K on Coffee yield.

1. BASAL CONDITIONS :

(i) Forest. (ii) Reddish brown to dark red. (iii) Seedlings. (iv) Arabica Coffee. (v) Planted in 1950 (2·3 m.×2·3 m.) (vi) N.A. (vii) Nil. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) 299 cm. ; 361 cm. ; 328 cm. ; 250 cm. ; 281 cm. (xii) December to March.

2. TREATMENTS :

6 manurial treatments : $M_1$=22·4 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$, $M_2$=33·6 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$, $M_3$=50·4 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$, $M_4$=33·6 Kg/ha. of N+50·4 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$, $M_5$=33·6 Kg/ha. of N+50·4 Kg/ha. of $P_2O_5$+67·3 Kg/ha. of $K_2O$ and $M_6$=50·4 Kg/ha. of N+75·7 Kg/ha. of $P_2O_5$+100·9 Kg/ha. of $K_2O$.

3. DESIGN :

(i) L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) One ; 1838 plants/ha. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of ripe cherry. (iv) (a) 1950—N.A. (b) N.A. (c) Nil. (v) Not known. (vi) to (vii). Nil.

5. RESULTS :

60(248)

(i) 4712 Kg/ha. (ii) 2964 Kg/ha. (iii) The treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 3635 | 4277 | 5353 | 5049 | 5179 | 4780 |

61(145)

(i) 3042 Kg/ha. (ii) 377·7 Kg/ha. (iii) The treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 3713 | 3592 | 3036 | 2420 | 2820 | 2672 |

C.D.=454·8 Kg/ha.

62(245)

(i) 5465 Kg/ha. (ii) 3069 Kg/ha. (iii) The treetment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 5774 | 6424 | 6443 | 5487 | 4531 | 4130 |

**63(210)**

(i) 5490 Kg/ha. (ii) 3070 Kg/ha. (iii) The treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 5927 | 6424 | 6443 | 5487 | 4531 | 4130 |

**64(169)**

(i) 1236 Kg/ha. (ii) 826·4 Kg/ha. (iii) The treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 880 | 1358 | 1912 | 1071 | 956 | 1243 |

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**Crop :- Coffee.** **Ref :- Ms. 60(199), 61(201), 62(182), 63(181), 64(139).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'M'.**

Object :—To study the effect of varying combinations of N, P and K on the yield of Coffee.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Reddish brown to dark red. (iii) Seedlings. (iv) Coorg Arabica. (v) Old garden (vi) Old garden. (vii) Nil. (viii) Weeding, digging and intercultivation. (ix) Nil. (x) Unirrigated. (xi) 299 cm. ; 361 cm. ; 328 cm. ; 250 cm. ; 281 cm. (xii) N.A.

2. TREATMENTS :

5 manurial treatments : $M_0$=Control (no manure), $M_1$=89·7 Kg/ha. of N, $M_2=M_1+50{\cdot}4$ Kg/ha. of $P_2O_5$, $M_3=M_1+67.2$ Kg/ha. of $K_2O$ and $M_4=M_2+67{\cdot}2$ Kg/ha. of $K_2O$.
N applied in three equal doses, $P_2O_5$ and $K_2O$ applied in two equal doses.

3. DESIGN :

(i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 20. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of ripe cherry. (iv) (a) 1937—contd (modified in 1959). (b) N.A, (c) Nil. (v) Not known. (vi) and (vii) Nil.

5. RESULTS :

**60(199)**

(i) 377·0 Kg/ha. (ii) 96·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ |
|---|---|---|---|---|---|
| Av. yield | 152 | 381 | 379 | 461 | 512 |

**61(201)**

(i) 6035 Kg/ha. (ii) 423·1 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ |
|---|---|---|---|---|---|
| Av. yield | 4683 | 5889 | 7263 | 5681 | 6661 |

C.D.=583·0 Kg/ha.

62(182)

(i) 910 Kg/ha. (ii) 48·1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ |
|---|---|---|---|---|---|
| Av. yield | 501 | 910 | 950 | 1037 | 1153 |

63(181)

(i) 2046 Kg/ha. (ii) 583·7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ |
|---|---|---|---|---|---|
| Av. yield | 1406 | 1816 | 2627 | 2055 | 2324 |

64(139)

(i) 355 Kg/ha. (ii) 193·3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_0$ | $M_1$ | $M_2$ | $M_3$ | $M_4$ |
|---|---|---|---|---|---|
| Av. yield | 205 | 383 | 473 | 311 | 400 |

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**Crop :- Coffee.** **Ref :- Ms. 60(200), 61(202), 62(183), 63(182), 64(140).**

**Site :- Centrel Coffee Res. Instt., Balehonnur.** **Type :- 'M'.**

Object :— To study the effect of varying doses of N with constant level of P and K on the yield of Coffee.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Reddish brown to dark red. (iii) Seedlings. (iv) Kent's clones. (v) Planted in 1952 (2·3 m.×2·3 m.). (vi) N.A. (vii) Nil. (viii) Weeding, digging and intercultivation. (ix) Nil. (x) Un-irrigated. (xi) 299 cm. ; 361 cm. ; 328 cm. ; 250 cm. ; 281 cm. (xii) N.A.

2. TREATMENTS :

5 levels of N : $N_0=0$, $N_1=44·8$, $N_2=67·2$, $N_3=89·6$ and $N_4=112·1$ Kg/ha.
33·6 Kg/ha. of $P_2O_5$ and 44·8 Kg/ha. of $K_2O$ applied to all plots with N.

3. DESIGN :

(i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 25. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of ripe cherry. (iv) (a) 1952-contd. (b) N.A. (c) Nil. (v) Non known. (vi) and (vii) Nil.

5. RETULTS :

60(200)

(i) 1704 Kg/ha. (ii) 370·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $N_4$ |
|---|---|---|---|---|---|
| Av. yield | 1291 | 1493 | 1987 | 1256 | 2492 |

61(202)

(i) 4193 Kg/ha. (ii) 903·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $N_4$ |
|---|---|---|---|---|---|
| Av. yield | 4599 | 4266 | 3176 | 4584 | 4341 |

**62(183)**

(i) 1341 Kg/ha. (ii) 221·9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $N_4$ |
|---|---|---|---|---|---|
| Av. yield | 842 | 1382 | 1300 | 1339 | 1844 |

**63(182)**

(i) 3084 Kg/ha. (ii) 1236 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $N_4$ |
|---|---|---|---|---|---|
| Av. yield | 2160 | 2597 | 2977 | 3842 | 3843 |

C.D.=1703·2 Kg/ha.

**64(140)**

(i) 1123 Kg/ha. (ii) 199·1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $N_4$ |
|---|---|---|---|---|---|
| Av. yield | 757 | 1073 | 1140 | 1267 | 1378 |

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**Crop :- Coffee.** **Ref :- Ms. 60(202), 61(207), 62(189), 63(185), 64(145).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'M'.**

Object:— To study the effect of N, P and K on the yield of Coffee.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Reddish brown to dark red. (iii) Seedlings. (iv) Arabica. (v) Planted in 1954 (1·8 m. 1.8 m.). (vi) 8 months. (vii) N.A. (viii) Weeding, digging and interculturing. (ix) Nil. (x) Unirrigated. (xi) 299 cm.; 361 cm.; 328 cm.; 250 cm.; 281 cm. (xii) Oct. to Dec.

2. TREATMENTS :

6 manurial treatments : $T_0$=Control, $T_1$=89·7 Kg/ha. of N, $T_2$=$T_1$+50·4 Kg/ha. of $P_2O_5$+67·3 Kg/ha. of $K_2O$, $T_3$=$T_1$+50·4 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$, $T_4$=$T_1$+33·6 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$ and $T_5$=$T_1$+33·6 Kg/ha. of $P_2O_5$+67·3 Kg/ha. of $K_2O$.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 15. (v) One row around each plot. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of ripe cherry. (iv) (a) 1960-contd. (b) N.A. (c) Nil. (v) Not known. (vi) and (vii) Nil.

5. RESULTS :

**60(202)**

(i) 2703 Kg/ha. (ii) 477·1 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 2300 | 3118 | 2186 | 2591 | 3340 | 2685 |

C.D.=719·0 Kg/ha.

61(207)

(i) 2223 Kg/ha. (ii) 151·6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1960 | 2494 | 2415 | 1238 | 2897 | 2332 |

C.D.=228·5 Kg/ha.

62(189)

(i) 3341 Kg/ha. (ii) 564·3 Kg/ha. (iii) Treatment differences are not significant (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 3868 | 3496 | 3209 | 3221 | 2694 | 3560 |

63(185)

(i) 3587 Kg/ha. (ii) 1762 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 2920 | 3635 | 3464 | 3565 | 3214 | 4722 |

64(145)

(i) 4280 Kg/ha. (ii) 1624 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 3625 | 3506 | 5282 | 5006 | 4236 | 4024 |

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**Crop :- Coffee.** **Ref :- Ms. 60(215), 61(205), 62(187), 63(183), 64(142).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'M'.**

Object :— To find out the effect of minor elements on the growth and yield of Coffee.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Reddish brown to dark red. (iii) Seedlings. (iv) Arabica. (v) Planted in 1957 (1·8 m. × 1·8 m.). (vi) and (vii) N.A. (viii) Weeding, digging and interculturing. (ix) Nil. (x) Unirrigated. (xi) 299 cm. ; 361 cm. ; 328 cm. ; 250 cm. ; and 281 cm. (xii) Dec. to March in 1960 and Oct. to Dec. for other years.

2. TREATMENTS :

6 treatments : $M_1$=12 gm./plant of Sequestrant NaNe, $M_2$=12 gm./plant of NaCu, $M_3$=12 gm./plant of NaCa, $M_4$=12 gm./plant of Metaquest (EDTA), $M_5$=12 gm./plant of essential mineral elements and $M_6$=40 gm. of N+30 gm. of $P_2O_5$+40 gm. of $K_2O$ mixture only.

The names of treatments are trade names of chemicals used.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 3·7 m. × 3·7 m. (b) 4. (v) One row around each plot. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of ripe cherry. (iv) (a) 1959-contd. (b) Yes. (c) Nil. (v) Not known. (vi) and (vii) Nil.

RESULTS :

**60(215)**

(i) 637 Kg/ha. (ii) 394·6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 635 | 919 | 735 | 558 | 594 | 381 |

**61(205)**

(i) 3·17 Kg/plot. (ii) 1·0 Kg/plot. (iii) Treatment differences are significant. (iv) Av. yield of ripe cherry in Kg/plot.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 3·60 | 4·32 | 2·64 | 2·38 | 2·67 | 3·42 |

C.D.=1·19 Kg/plot.

**62(187)**

(i) 5·80 Kg/plot. (ii) 4·57 Kg/plot. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/plot.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 3·13 | 6·52 | 8·99 | 4·96 | 6·86 | 4·35 |

**63(183)**

(i) 38·72 Kg/plot. (ii) 20·40 Kg/plot. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/plot.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 36·25 | 50·50 | 28·45 | 36·10 | 30·25 | 50·75 |

**64(142)**

(i) 1·11 Kg/plot. (ii) 1·11 Kg/plot. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/plot.

| Treatment | $M_1$ | $M_2$ | $M_3$ | $M_4$ | $M_5$ | $M_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 0·48 | 1·49 | 0·99 | 0·94 | 1·40 | 1·34 |

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**Crop :- Coffee.** **Ref :- Ms. 60(134), 61(121), 62(126), 63(115), 64(81).**

**Site :- Central Coffee Res. Stn., Chethally.** **Type :- 'M'.**

Object :—To find out the best combination of N, P and K for Robusta Coffee.

1. BASAL CONDITIONS :

(i) Laterite and red loamy. (ii) Forest. (iii) Seedlings. (iv) Robusta coffee. (v) Planted in 1954. (vi) 9 months old. (vii) 2·5 tonne/ha. of lime. (viii) N.A. (ix) Nil. (x) Unirrigated. (xi) 243 ; 228 ; 206 ; 158 and 231 cm. (xii) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 4 levels of N : $N_0=0$, $N_1=67·2$, $N_2=100·8$ and $N_3=134·4$ Kg/ha.
(2) 2 levels of $P_2O_5$ : $P_0=0$ and $P_1=50·4$ Kg/ha.
(3) 2 levels of $K_2O$ : $K_0=0$ and $K_1=67·2$ Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16 plots/block. (b) N.A. (iii) 3. (iv) 20 plants/plot. (v) One common guard row around the plot. (vi) Yes,

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of ripe cherry. (iv) (a) 1954—contd. (b) Yes. (c) Nil. (v) N.A. (vi) Nil. (vii) and Nil.

5. RESULTS :

**60(134)**

(i) 937 Kg/ha. (ii) 417·8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of coffee seed in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $K_0$ | $K_1$ | Mean |
|---|---|---|---|---|---|---|---|
| $P_0$ | 694 | 1032 | 974 | 781 | 911 | 829 | 870 |
| $P_1$ | 926 | 854 | 1312 | 923 | 965 | 1042 | 1004 |
| Mean | 810 | 943 | 1143 | 852 | 938 | 936 | 937 |
| $K_0$ | 853 | 801 | 1205 | 894 | | | |
| $K_1$ | 767 | 1085 | 1081 | 810 | | | |

**61(121)**

(i) 1388 Kg/ha. (ii) 869·4 Kg/ha. (iv) None of the effects is significant. (iv) Av. yield of coffee seed in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $K_0$ | $K_1$ | Mean |
|---|---|---|---|---|---|---|---|
| $P_0$ | 1029 | 1228 | 1403 | 1340 | 1242 | 1258 | 1250 |
| $P_1$ | 1377 | 1312 | 1613 | 1804 | 1318 | 1734 | 1526 |
| Mean | 1203 | 1270 | 1508 | 1572 | 1280 | 1496 | 1388 |
| $K_0$ | 1150 | 1023 | 1434 | 1512 | | | |
| $K_1$ | 1256 | 1517 | 1582 | 1632 | | | |

**62(126)**

(i) 806 Kg/ha. (ii) 396·4 Kg/ha. (iii) Main effect of K is significant. (iv) Av. yield of coffee seed in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $K_0$ | $K_1$ | Mean |
|---|---|---|---|---|---|---|---|
| $P_0$ | 622 | 875 | 1186 | 791 | 1023 | 713 | 868 |
| $P_1$ | 606 | 751 | 860 | 757 | 829 | 659 | 744 |
| Mean | 614 | 813 | 1023 | 774 | 926 | 686 | 806 |
| $K_0$ | 805 | 916 | 969 | 1012 | | | |
| $K_1$ | 423 | 710 | 1077 | 536 | | | |

C.D. for K marginal means=233·6 Kg/ha.

**63(115)**

(i) 2530 Kg/ha. (ii) 654·7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of coffee seed in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $K_0$ | $K_1$ | Mean |
|---|---|---|---|---|---|---|---|
| $P_0$ | 2150 | 2560 | 2575 | 2875 | 2464 | 2616 | 2540 |
| $P_1$ | 2516 | 2180 | 2809 | 2575 | 2544 | 2496 | 2520 |
| Mean | 2333 | 2370 | 2692 | 2725 | 2504 | 2556 | 2530 |
| $K_0$ | 2189 | 2030 | 2768 | 3029 | | | |
| $K_1$ | 2477 | 2710 | 2616 | 2421 | | | |

**64(81)**

(i) 1567 Kg/ha. (ii) 473·2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of coffee seed in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $K_0$ | $K_1$ | Mean |
|---|---|---|---|---|---|---|---|
| $P_0$ | 1225 | 1702 | 1736 | 1665 | 1615 | 1549 | 1582 |
| $P_1$ | 1707 | 1220 | 1786 | 1495 | 1561 | 1543 | 1552 |
| Mean | 1466 | 1461 | 1761 | 1580 | 1588 | 1546 | 1567 |
| $K_0$ | 1654 | 1499 | 1557 | 1642 | | | |
| $K_1$ | 1278 | 1423 | 1965 | 1518 | | | |

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**Crop :- Coffee.** **Ref :- Ms. 65(86).**

**Site :- Coffee Res. Stn., Chethally.** **Type :- 'M'.**

Object :—To find out optimum dose of balanced fertiliser and its time of application.

1. BASAL CONDITIONS :

(i) Jungle. (ii) Clay type. (iii) Seedlings. (iv) S. 795. (v) 1960 (2·1 m.×2·1 m.). (vi) 9 months. (vii) Nil. (viii) Digging, caffling and plant training. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Jan.-Feb.

2. TREATMENTS :

Main-plot treatments :

5 doses of fertilizers : $F_1$=67·2 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$, $F_2$=112·0 Kg/ha. of N+67·2 Kg/ha. of $P_2O_5$+89·6 Kg/ha. of $K_2O$, $F_3$=156·8 Kg/ha. of N+100·8 Kg/ha. of $P_2O_5$+134·4 Kg/ha. of $K_2O$, $F_4$=201·6 Kg/ha. of N+134·4 Kg/ha. of $P_2O_5$+179·2 Kg/ha. of $K_2O$, and $F_5$=246·4 Kg/ha. of N+168.0 Kg/ha. of $P_2O_5$+224·0 Kg/ha. of $K_2O$.

Sub-plot treatments :

3 times of application (split dose) : $T_1$=Twice a year (pre and post monsoon), $T_2$=Thrice a year (pre blossom, pre monsoon and post monsoon) and $T_3$=4 times a year (pre blossom, pre monsoon mid monsoon and post monsoon).

3. DESIGN :

(i) Split plot. (ii) (a) 5 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 8·5 m.× 8·5 m. (b) 16. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Ripe cherry—yield data. (iv) to (vii) Nil.

5. RESULTS :

(i) 1885 Kg/ha. (ii) (a) 1369·7 Kg/ha. (b) 895·4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of ripe cherry in Kg/ha.

| | $F_1$ | $F_2$ | $F_3$ | $F_4$ | $F_5$ | Mean |
|---|---|---|---|---|---|---|
| $T_1$ | 1407 | 1107 | 1665 | 1716 | 1708 | 1521 |
| $T_2$ | 1270 | 2557 | 2918 | 1802 | 1476 | 2005 |
| $T_3$ | 1699 | 2231 | 2188 | 2223 | 2300 | 2128 |
| Mean | 1459 | 1965 | 2257 | 1914 | 1828 | 1885 |

**Crop :- Coffee.** **Ref :- Ms. 65(84).**

**Site :- Coffee Res. Stn., Chethally.** **Type :- 'M'.**

Object :—To find the best combination of N, P and K for Robusta Coffee.

1. BASAL CONDITIONS :

(i) Jungle. (ii) Dark brown sandy loam. (iii) Seedlings. (iv) Robusta. (v) Planted in 1954 (4 m.× 4 m.). (vi) 9 months old. (vii) Nil. (viii) Weeding, digging, scuffling and plant training. (ix) Nil. (x) Unirrigated. (xi) Nil. (xii) Jan.—Feb.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 4 levels of N : $N_0=0$, $N_1=67{\cdot}2$, $N_2=100{\cdot}8$ and $N_3=134{\cdot}4$ Kg/ha.
(2) 2 levels of $P_2O_5$ : $P_0=0$ and $P_1=50{\cdot}4$ Kg/ha.
(3) 2 levels of $K_2O$ : $K_0=0$ and $K_1=67{\cdot}2$ Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) 22·9 m.×15·9 m. (b) 20 plants/plot. (v) and (vi) Yes.

4. GENERAL :

(i) Poor. (ii) Shot hole borer—cutting and removing. (iii) Ripe cherry yield data. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Experiment conducted at Shigoda.

5. RESULTS:

(i) 316 Kg/ha. (ii) 212·8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of ripe cherry in Kg/ha.

| | $N_0$ | $N_1$ | $N_2$ | $N_3$ | $K_0$ | $K_1$ | Mean |
|---|---|---|---|---|---|---|---|
| $P_0$ | 221 | 242 | 430 | 409 | 335 | 316 | 326 |
| $P_1$ | 217 | 353 | 401 | 252 | 282 | 330 | 306 |
| Mean | 219 | 297 | 415 | 330 | 309 | 323 | 316 |
| $K_0$ | 213 | 273 | 325 | 421 | | | |
| $K_1$ | 225 | 321 | 505 | 240 | | | |

**Crop :- Coffee.** **Ref :- Ms. 65(87).**

**Site :- Coffee Res. Stn., Chethally.** **Type :- 'M'.**

**Object** :—To find out a suitable source of phosphate and study its interaction with N and liming.

1. BASAL CONDITIONS :

(i) Jungle. (ii) Black loam. (iii) Seedlings. (iv) S. 795. (v) 1957 (2 m.×2 m.). (vi) 9 months. (vii) 44·8 Kg/ha. of N+36·6 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$. (viii) Digging, scuffling and plant training etc. (ix) and (x) Nil. (xi) N.A. (xii) Jan.-Feb.

2. TREATMENTS :

**Main-plot treatments :**

All combinations of (1) and (2)

(1) 2 fertilizers : $L_1$=12·6 Q/ha. of lime and $L_2$=12·6 Q/ha. of rock phosphate.

(2) 3 sources of N : $S_1$=A/S/N, $S_2$=Urea and $S_3$=A/S.

**Sub-plot treatments :**

6 sources of phosphate : $P_0$=Control (no phosphate), $P_1$=Rock phosphate, $P_2$=Rock phosphate, $P_3$=Super complex, $P_5$=A/P and $P_5$=Basic slag.

Doses of N and P applied are not available.

3. DESIGN :

(i) Split plot. (ii) (a) 6 main-plots/replication ; 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 7·9 m.× 11·9 m. (b) 24. (v) One border row. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Bordeaux mixture sprayed. (iii) Ripe cherry yield data. (iv) (a) 1965—contd. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS :

(i) 5390 Kg/ha. (ii) (a) 1539·9 Kg/ha. (b) 1307·4 Kg/ha. (iii) Interaction L×S and main effect of P are significant. (iv) Av. yield of ripe cherry in Kg/ha.

| | $L_1$ | $L_2$ | $P_0$ | $P_1$ | $P_2$ | $P_3$ | $P_4$ | $P_5$ | Mean |
|---|---|---|---|---|---|---|---|---|---|
| $S_1$ | 4330 | 6219 | 6426 | 5476 | 5822 | 4839 | 3790 | 5297 | 5275 |
| $S_2$ | 5936 | 5384 | 6051 | 5651 | 5904 | 5509 | 5254 | 5591 | 5660 |
| $S_3$ | 5126 | 5344 | 5065 | 5012 | 6318 | 4543 | 5023 | 5449 | 5235 |
| Mean | 5131 | 5649 | 5847 | 5380 | 6015 | 4964 | 4689 | 5446 | 5390 |
| $P_0$ | 5446 | 6249 | | | | | | | |
| $P_1$ | 5200 | 5559 | | | | | | | |
| $P_2$ | 5776 | 6254 | | | | | | | |
| $P_3$ | 4852 | 5075 | | | | | | | |
| $P_4$ | 4714 | 4664 | | | | | | | |
| $P_5$ | 4797 | 6094 | | | | | | | |

C.D. for P marginal means =871·6 Kg/ha.

C.D. for body of L×S table=1143·6 Kg/ha.

**Crop :- Coffee.** **Ref :- Ms. 60(194).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'C'.**

Object :— To study the influence of topping on growth and yield of robusta Coffee.

1. BASAL CONDITIONS :

(i) Old garden. (ii) Reddish brown to dark red. (iii) Seedlings. (iv) Robusta. (v) to (vii) Old (2·7 m.×2·7 m.). (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) 299 cm. (xii) Dec. to March.

2. TREATMENTS :

2 cultural treatments : $T_1$=Topped at 91 cm. height and $T_2$=Topped at 122 cm. height.

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) N.A. (b) 32 (gross) and 12 (net). (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Weight of ripe cherry. (iv) (a) 1951 to 1960. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2980 gm./plant. (ii) 869·4 gm./plant. (iii) Treatment difference is not significant. (iv) Av. yield of ripe cherry in gm./plant.

| Treatment | $T_1$ | $T_2$ |
|---|---|---|
| Av. yield | 3314 | 2646 |

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**Crop :- Coffee.** **Ref :- Ms. 60(28).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'C'.**

Object : — To study the effect of various grades of cultivation on old Coffee during different seasons as reflected by yield.

1. BASAL CONDITIONS :

(i) Variety of coffee is old Arabica of Coorg of age 30 to 40 years. (ii) Brown soil. (iii) N.A. (iv) Arabica Coffee (Coorg). (v) N.A. with spacing 152 cm.×152 cm. (vi) 8 months. (vii) Nil. (viii) Weeding, manuring and shade regulation. (ix) Nil. (x) Irrigated. (xi) 301 cm. (xii) Nov. to Dec. 1960.

2. TREATMENTS :

7 cultural treatments : $T_1$=Deep digging in August, $T_2$=Light digging in August, $T_3$=Deep digging in November, $T_4$=Light digging in November, $T_5$=Deep digging in April, $T_6$=Scuffling in April and $T_7$=Weeding only.

3. DESIGN:

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 80 plants. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Stem borer and leaf disease. Swabbling with B.H.C. and spraying with B. mixture. (iii) Yield of ripe cherry and clean coffee. (iv) (a) 1954—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 2183 Kg/ha. (ii) 596·7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of coffee in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 2230 | 2170 | 2105 | 2363 | 2451 | 2133 | 1827 |

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**Crop .- Coffee.** **Ref :- 60(198), 61(200).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'C'.**

Object :— To study the effect of varying soil cultivation practices on the yield of Coffee.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Reddish brown to dark red (moderately grannular). (iii) Seedlings. (iv) Coorg arabica. (v) 30 years old garden (1·5 m.×1·5 m.). (vi) and (vii) N.A. (viii) As per treatments. (ix) Nil. (x) Unirrigated. (xi) 299 cm. ; 361 cm. (xii) N.A.

2. TREATMENTS :

7 cultural treatments : $T_1$=Deep digging in August, $T_2$=Light digging in August, $T_3$=Deep digging in November, $T_4$=Light digging in November, $T_5$=Deep digging in April, $T_6$=Scuffling in April and $T_7$=Weeding only.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 80 plants. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of ripe cherry. (iv) (a) 1954 to 1961. (b) Nil. (v) (a) Not known. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

60(198)

(i) 3144 Kg/ha. (ii) 867 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 3218 | 3123 | 3034 | 3399 | 3527 | 3072 | 2633 |

61(200)

(i) 2065 Kg/ha. (ii) 689 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 2281 | 2474 | 1956 | 2201 | 2048 | 1632 | 1865 |

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**Crop :- Coffee.** **Ref :- Ms. 63(212), 64(172).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'C'.**

Object :— To determine the optimum spacing for planting Coffee.

1. BASAL CONDITIONS :

(i) Forest. (ii) N.A. (iii) Seedlings. (iv) Arabica S-795. (v) to (vii) N.A. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) More than 152 cm. (xii) Dec. and March.

2. TREATMENTS :

6 spacings : $S_1$=7·6 cm.×7·6 cm., $S_2$=10·2 cm.×10·2 cm., $S_3$=15·2 cm.×7·6 cm., $S_4$=15·2 cm.×10·2 cm., $S_5$=15·2 cm.×15·2 cm. and $S_6$=15.2 cm.×22·9 cm.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 1/62·2 ha. (b) N.A. (v) Yes. Details N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Weight of ripe cherry. (iv) (a) 1963 to 1964. (b) Yes. (c) Nil. (v) Not known. (vi) Nil. (vii) Experiment conducted at Private estate, Kalpetta.

5. RESULTS :

63(212)

(i) 4384 Kg/ha. (ii) 215·1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 5558 | 4235 | 4918 | 3757 | 3133 | 4706 |

64(172)

(i) 4726 Kg/ha. (ii) 219·8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 6336 | 4647 | 5388 | 4493 | 3591 | 3902 |

C.D.=261·3 Kg/ha.

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**Crop :- Coffee.** **Ref :- 60(193), 61(203),62(184).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'C'.**

Object :—To study the influence of varying soil cultivation practices on the yield of Coffee.

1. BASAL CONDITIONS :

(i) 40 years old garden. Land slopy and facing east, north-east. (ii) Reddish brown to dark red. (iii) Seedlings. (iv) Arabica coffee. (v) Age old (1·5 m.×1·5 m.) (vi) Age old. (vii) Nil. (viii) As per treatments. (ix) Nil. (x) Unirrigated. (xi) 299 cm. ; 361 cm. ; 328 cm. (xii) December to March.

2. TREATMENTS :

6 cultural treatments : $T_0$=Control (weeding only), $T_1$=Trenching 46 cm.×23 cm.×152 cm. in May, $T_2$=Trenching 23 cm.×23 cm.×152 cm. in May, $T_3$=Renovation pitting 46 cm.×23 cm.×91 cm. in May, $T_4$=Deep Digging in Nov. and $T_5$=Light digging in Nov.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 80. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Weight of ripe cherry. (iv) (a) 1954 to 1962. (b) Yes. (c) Nil. (v) Chethalli. (vi) and (vii) Nil.

5. RESULTS :

60(193)

(i) 723 gm./plant. (ii) 240·4 gm./plant. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in gm./plant.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av.yield | 716 | 662 | 852 | 706 | 674 | 726 |

61(203)

(i) 564 gm./plant. (ii) 161·2 gm./plant. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in gm./plant.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 574 | 481 | 757 | 633 | 473 | 465 |

62(184)

(i) 498 gm./plant. (ii) 182·3 gm./plant. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in gm./plant.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 432 | 520 | 610 | 455 | 465 | 506 |

**Crop :- Coffee.** **Ref :- Ms. 60(137), 61(124).**

**Site :- Coffee Res. Sub-Stn., Chethally.** **Type :- 'C'.**

Object :—To find out the effect of different cultural operations on the yield of Coffee.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Lateritic. (iii) By seedlings. (iv) Coorg Arabica. (v) 30 years old with spacing 183 cm. × 183 cm. (vi) 1 year. (vii) N.A. (viii) As per treatments. (ix) Nil. (x) Unirrigated. (xi) 243 cm. ; 228 cm. (xii) N.A.

2. TREATMENTS :

6 cultural treatments : $T_1$=Trenching 46 cm. deep, $T_2$=Trenching 23 cm. deep, $T_3$=Renovation pitting, $T_4$=Light digging, $T_5$=Deep digging and $T_6$=Weeding only.

3. DESIGN :

(i) L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) Gross 160 plants/plot and net 112 plants/plot. (v) One row on all sides. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of coffee. (iv) (a) 1954 to 1963. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

60(137)

(i) 5834 Kg/ha. (ii) 86·8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of coffee in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 5934 | 5868 | 5139 | 6120 | 6064 | 5878 |

C.D.=97·0 Kg/ha.

61(124)

(i) 2016 Kg/ha. (ii) 29·9 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of coffee in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 2028 | 2070 | 2420 | 2097 | 1770 | 1714 |

C.D.=35·4 Kg/ha.

**Crop :- Coffee.** **Ref : Ms. 61(156), 62(139).**

**Site :- Coffee Res. Sub-Stn., Chethally.** **Type :- 'C'.**

Object :—To find out the most suitable method of soil management in old Coffee plantation.

1. BASAL CONDITIONS :

(i) About 30 years old coffee plants. (ii) Latrite; red loamy. (iii) Seedlings. (iv) Arabica (Coorgs). (v) and (vi) 30 years old coffee plants.. (vii) 60 Kg/ha. of N as A/S+30 Kg/ha. of $P_2O_5$ as Super + 40 Kg/ha. of $K_2O$ as Mur. Pot. (viii) As per treatments. (ix) Nil. (x) Unirrigated. (xi) 228 cm, ; 205 cm. (xii) N.A.

2. TREATMENTS :

6 cultural treatments : $T_1$=Trenching 46 cm. deep. $T_2$=Trenching 23 cm. deep, $T_3$=Renovation pitting 46 cm. deep, $T_4$=Light digging about 10 cm. deep, $T_5$=Deep digging about 17 cm. deep and $T_6$=Weeding only.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 19·5 m.×14·6 m. (b) Gross 160 plants and net 112 plants. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of ripe cherry. (iv) (a) 1954—contd. (b) yes. (c) Nil. (v) and (vi) Nil.. (vii) Date for 1960 N.A.

5. RESULTS :

61(156)

(i) 2633 Kg/ha. (ii) 565·9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of coffee in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 2809 | 2851 | 3051 | 2660 | 2251 | 2174 |

62(139)

(i) 5880 Kg/ha. (ii) 1947 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of coffee in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 5249 | 5313 | 5605 | 5379 | 7498 | 6239 |

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**Crop :- Coffee.** **Ref :- Ms. 65 (85).**

**Site :- Coffee Res. Sub-Stn., Chethally.** **Type :- 'C'.**

Object :—To determine the optimum spacing for Coffee.

1. BASAL CONDITIONS :

(i) Jungle. (ii) Clay type. (iii) Seedling. (iv) S—795. (v) Year 1960. (vi) 9 months. (vii) N.A. (viii) Digging, scaffling and plant training etc. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Jan. to Feb.

2. TREATMENTS :

6 Spacings (in cm.) : $T_1$=91×91, $T_2$=122×122, $T_3$=183×91, $T_4$=183×122, $T_5$=183×183 and $T_9$=183×274.

3. DESIGN:

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 14·6 m.×10·9 m. (b) N.A. (v) Yes.

4. GENERAL:

(i) Fair. (ii) Borer shebling B.H.C. sprayed, Bordeaux to spray to contol berry blotch. (iii) Ripe cherry yield data. (iv) (a) 1964—N.A. (b) yes. (c) Nil. (v) and (vi) Nil. (vii) Experiment conducted at Kalpetta.

5. RESULTS:

(i) 5040 Kg/ha. (ii) 1339·5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 7104 | 5679 | 5658 | 5113 | 4135 | 2554 |

C.D.=1593·0 Kg/ha.

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**Crop :- Coffee.** **Ref :- Ms. 60(29).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'CM'.**

Object :—To find out the effect of different types of mulching with the addition to manures on the growth and yield of Coffee.

1. BASAL CONDITIONS:

(i) Old Arabica was uprooted and planted seedlings in 1954. Permanent shade was retained. (ii) Brown soil. (iii) By seed. (iv) Coffee Arabica (selections). (v) Date of sowing N.A., spacing 18 m.×1·8 m. (vi) 8 months. (vii) Nil. (viii) Weeding, suckering, swabbing and shade regulation. (ix) Nil. (x) Irrigated. (xi) 301 cm. (xii) Oct. to Dec. 1960.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 2 doses of manures : $D_1$=22·4 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$ and $D_2$=44·8 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$.

(2) 3 mulchings at 75·3 Q/ha. : $M_0$=No mulching, $M_1$=With dry leaf and $M_2$=With cherry husk.

Manures were applied in two doses in pre blossom and post blossom periods.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 35 plants (grass), 15 plants (net). (v) 20 plants. (vi) Yes.

4. GENERAL:

(i) Fairly satisfactory. (ii) Incidence of "Cercospora" disease, spraying of bordeaux mixture. (iii) Yield of ripe cherry and clean Coffee. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 6950 Kg/ha. (ii) 195·8 Kg/ha. (iii) Main effect of M and interaction D×M are highly significant. (iv) Av. yield of ripe cherry in Kg/ha.

| | $M_0$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|
| $D_1$ | 5889 | 7683 | 7395 | 6989 |
| $D_2$ | 6046 | 6364 | 8323 | 6911 |
| Mean | 5968 | 7024 | 7859 | 6950 |

C.D. for M marginal means=208·5 Kg/ha.
C.D. for body of the table=295·0 Kg/ha.

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**Crop :- Coffee.** **Ref :- Ms. 60(30).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'CM'.**

Object :—To find out the effect of mulching, cover cropping and G.M. on the stand and growth of Coffee plants

1. BASAL CONDITIONS :

(i) Old Arabica was uprooted and planted with seedlings in 1954. The silver oaks in the blocks were uprooted and other shade trees were retained. (ii) Brown soil. (iii) By seed. (iv) Coffee Arabica (selections). (v) March 1953, spacing 1·8 m.×1·8 m. (vi) 8 months. (vii) 89·7 Kg/ha. of N+50·4 Kg/ha. of $P_2O_5$+67·2 Kg/ha. of $K_2O$. N applied in 3 doses in 3 : 2 : 3 ratios in pre blossom, pre monsoon and post monsoon periods. P and K applied in two equal doses in pre blossom and post monsoon periods. (viii) Weeding, suckering, swabbing and shade regulation. (ix) Nil. (x) Irrigated. (xi) 301 cm. (xii) Nov. and Dec. 1960.

2. TREATMENTS :

6 cultural treatments : $T_0$=No mulching, $T_1$=Mulching with dry leaves, $T_2$=Mulching with dry husk, $T_3$=Cover cropping, $T_4$=G.M. before monsoon and $T_5$=G.M. after monsoon.

$T_1$ and $T_2$ applied at 75·3 Q/ha. Crotolania was used as G.M.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 35 plants (gross), 15 plants (net). (v) 20 plants. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Incidence of leaf disease. Spraying with bordeaux mixture. (iii) Yield of ripe cherry and clean coffee. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 4899 Kg/ha. (ii) 283·7 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of coffee in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 3814 | 4648 | 6570 | 6446 | 3818 | 4099 |

C.D.=427·3 Kg/ha.

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**Crop :- Coffee.** **Ref :- Ms. 60(195), 61(198), 62(185).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'CM'.**

Object:—To find out the effect of mulching and different levels of manures on the yield of Coffee.

## 1. BASAL CONDITIONS :

(i) Old arabica was uprooted and newly planted with selections in 1954. Permanent shade was retained. (ii) Reddish brown to dark red. (iii) Seedlings. (iv) Arabica selection. (v) and (vi) Age old (1·8 m.× 1·8 m.). (vii) 33·6 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) 299 cm ; 361 cm ; 328 cm. (xii) Dec. to March.

## 2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 doses of N : $N_1$=22·4 and $N_2$=44·8 Kg/ha.

(2) 3 mulchings at 75 Q/ha. : $M_0$=No mulching, $M_1$=With dry leaf and $M_2$=With cherry husk.

N applied in two equal doses in pre blossom and post monsoon periods.

## 3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) Gross 35 plants ; net 15 plants. (v) and (vi) Yes.

## 4. GENERAL :

(i) Fair. (ii) Nil. (iii) Weight of ripe cherry. (iv) (a) 1956—contd. (treatments modified in 1963). (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) The mulch material could not be applied to the exptl. plots in time due to local difficulties in 1960.

## 5. RESULTS :

**60(195)**

(i) 2326 gm./plant. (ii) 653·2 gm./plant. (iii) None of the effects is significant. (iv) Av. yield of ripe cherry in gm./plant.

| | $M_0$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|
| $N_1$ | 1970 | 2570 | 2473 | 2338 |
| $N_2$ | 2022 | 2127 | 2792 | 2314 |
| Mean | 1996 | 2348 | 2632 | 2326 |

**61(198)**

(i) 878 gm./plant. (ii) 306·6 gm./plant. (iii) N effect is significant. (iv) Av. yield of ripe cherry in gm./plant.

| | $M_0$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|
| $N_1$ | 762 | 463 | 881 | 702 |
| $N_2$ | 1429 | 926 | 810 | 1055 |
| Mean | 1096 | 694 | 846 | 878 |

C.D. for N marginal means=gm./plant.

**62(185)**

(i) 1836 gm./plant. (ii) 587·5 gm./plant. (iii) None of the effects is significant. (iv) Av. yield of ripe cherry in gm./plant.

| Effect | $M_0$ | $M_1$ | $M_2$ | $N_1$ | $N_2$ | Mean |
|---|---|---|---|---|---|---|
| Av. yield | 1648 | 1753 | 2108 | 1715 | 1958 | 1836 |

**Crop :- Coffee.** **Ref :- Ms. 63(179), 64(137).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'CM'.**

Object :—To study the effect of two types of mulches in relation to fertilization on the yield of young Coffee.

1. BASAL CONDITIONS :

(i) Old Arabica was uprooted and newly planted with selections in 1954. Permanent shade was retained. (ii) Reddish brown to dark red. (iii) Seedlings. (iv) Arabica selections. (v) and (vi) Age old with 1·8 m. × 1·8 m. spacing. (vii) 33·6 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$ applied in two doses—pre blossom and post monsoon. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) 250 cm. ; 281 cm. (xii) Dec. to March.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 mulching treatments : $M_0$=No mulch (control), $M_1$=Leaf mulch at 125 Q/ha. and $M_2$= Pulper husk mulch at 125 Q/ha.

(2) 2 levels of N : $N_1$=44·8 and $N_2$=89·6 Kg/ha.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) Gross 35 plants, net 15 plants. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Weight of ripe cherry. (iv) 1956—contd. (modified in 1963 and 65). (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Trend of response to mulch is reversed due to biennial bearing habit of coffee in 1963.

5. RESULTS :

**63(179)**

(i) 1944 gm./plant. (ii) 441·3 gm./plant. (iii) None of the effects is significant. (iv) Av. yield of ripe cherry in gm./plant.

| | $M_0$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|
| $N_1$ | 1830 | 2019 | 1813 | 1887 |
| $N_2$ | 2320 | 1906 | 1778 | 2001 |
| Mean | 2075 | 1962 | 1796 | 1944 |

**64(137)**

(i) 948 gm./plant. (ii) 246·8 gm./plant. (iii) None of the effects is significant. (iv) Av. yield of ripe cherry in gm./plant.

| | $M_0$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|
| $N_1$ | 828 | 998 | 670 | 832 |
| $N_2$ | 902 | 1200 | 1090 | 1064 |
| Mean | 865 | 1099 | 880 | 948 |

**Crop :- Coffee.** **Ref :- Ms. 65(88).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'CM'.**

Object :— To study the effect of mulching on the yield of Coffee.

1. BASAL CONDITIONS :

(i) Jungle. (ii) Reddish brown to dark red. (iii) Seedlings. (iv) Arabica. (v) Planted in 1954. (vi) 9 months. (vii) N.A. (viii) Digging interculturing etc. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Jan. to Feb.

2. TREATMENTS :

6 mulching with manurial treatments: $T_0$=No mulch, $T_1$=Mulch with dry leaves @ 123·5 Q/ha., $T_2$=Mulch with cherry husk @ 123·5 Q/ha., $T_3$=Mulch with cherry husk @ 247·1 Q/ha., $T_4$=Mulch with cherry husk @ 247·1 Q/ha. in alternate rows and $T_5$=F.Y.M. @ 247·1 Q/ha.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 5·5 m.×9·1 m. (b) 15 (Net). (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) N.A. (iii) Yield of ripe cherry. (iv) (a) 1960-contd (modified in 1963 and 1965). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 5138 Kg/ha. (ii) 1726·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 4233 | 5534 | 4908 | 5284 | 5223 | 5646 |

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**Crop :- Coffee.** **Ref :- Ms. 60(197), 61(199), 62(186).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'CM'.**

Object :— To study the effect of N, P and K and prunning on the yield of Coffee.

1. BASAL CONDITIONS :

(i) Experiment laid out in sept. 1952 on coffee of 15-20 years age. The aspect is westren. Silver oak is the main shade with dadap lower canopy. (ii) Reddish brown. (iii) Seedlings. (iv) Coorg robusta. (v) and (vi) Age old (2·4 m.×2·4 m.). (vii) N.A. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) 299 cm. ; 361 cm. ; 328 cm. (xii) December to March.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of prunning : $P_0$=0 and $P_1$=Prunning.

(2) 3 levels of fertilizers : $F_0$=0, $F_1$=44·8 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$ and $F_2$=89·6 Kg/ha. of N+33·6 Kg/ha. of $P_2O_5$+44·8 Kg/ha. of $K_2O$.

3. DESIGN :

(i) L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) Gross 60 : net 32. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of ripe cherry. (iv) (a) 1952 to 1962. (b) Yes (c) Nil. (v) and (vi) Nil. (vii) The superiority of yield may be attributed to the biennial bearing habit of coffee plant in 1961. In 1962, though response to prunning was not significant the yields were quite higher.

5. RESULTS :

60(197)

(i) 1947 gm./plant. (ii) 603·3 gm,/plant. (iii) None of the effects is significant. (iv) Av. yield of ripe cherry in gm./plot.

| | $F_0$ | $F_1$ | $F_2$ | Mean |
|---|---|---|---|---|
| $P_0$ | 1885 | 1687 | 1827 | 1800 |
| $P_1$ | 2056 | 2125 | 2103 | 2095 |
| Mean | 1970 | 1906 | 1965 | 1947 |

61(199)

(i) 6966 gm./plant. (ii) 1587·5 gm./plant. (iii) Main effect of F alone is highly significant. (iv) Av. yield of ripe cherry in gm./plot.

| | $F_0$ | $F_1$ | $F_2$ | Mean |
|---|---|---|---|---|
| $P_0$ | 6456 | 6146 | 5980 | 6194 |
| $P_1$ | 7152 | 8203 | 7862 | 7739 |
| Mean | 6804 | 7174 | 6921 | 6966 |

C. D. for F marginal means = 503·9 gm./plant

62(186)

(i) 3254 gm./plant. (ii) 683·3 gm./plant. (iii) None of the effects is significant. (iv) Av. yield of ripe cherry in gm./plant.

| | $F_0$ | $F_1$ | $F_2$ | Mean |
|---|---|---|---|---|
| $P_0$ | 3036 | 3229 | 3431 | 3232 |
| $P_1$ | 2958 | 3619 | 3250 | 3276 |
| Mean | 2997 | 3424 | 3340 | 3254 |

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**Crop :- Coffee.** **Ref Ms. 60(196), 61(204), 62(181).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'CM'.**

Object :— To study the effect of mulching, cover cropping and G.M. on the growth and yield of Coffee.

1. BASAL CONDITIONS :

(i) Old arabica was uprooted and planted with selections in 1954. The silver oak in the block was uprooted but other shade trees were retained. (ii) Reddish brown to dark red. (iii) Seedlings. (iv) Arabica selections. (v) and (vi) Age old (1·8 m. × 1·8 m.). (vii) N.A. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) 299 cm. ; 361 cm. ; 328 cm. (xii) Dec. to March.

2. TREATMENTS :

6 cultural and manurial treatments : $T_0$=No mulching, $T_1$=Mulching with dry leaves at 75·3 Q/ha., $T_2$= Mulching with cherry husk at 75·3 Q/ha., $T_3$=Cover cropping, $T_4$= G.M. before monsoon and $T_5$=G.M. after monsoon.

Quantity of G.M. N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 15 plants (net). (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of ripe cherry. (iv) (a) 1956-contd. (modified in 1963). (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

**60(196)**

(i) 1160 gm./plant. (ii) 689·5 gm./plant. (iii) Treatment differences are not significant. (iv) Av yield of ripe cherry in gm./plant.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1149 | 1278 | 1837 | 794 | 1111 | 790 |

**61(209)**

(i) 368 gm./plant. (ii) 114·9 gm./plant. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in gm./plant.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 249 | 386 | 499 | 318 | 378 | 378 |

**62(181)**

(i) 923 gm./plant. (ii) 310·7 gm./plant. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in gm./plant.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 758 | 854 | 1317 | 680 | 951 | 979 |

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**Crop :- Coffee.** **Ref :- Ms. 63(180), 64(141).**

**Site:- Central Coffee Res. Instt., Balehonnur.** **Type :- 'CM'.**

Object :— To study the effect of mulching on the yield of Coffee.

1. BASAL CONDITIONS :

(i) Old arabica was uprooted and planted with selections in 1954. The silver oak in the block was uprooted but other shade trees were retained. (ii) Reddish brown. (iii) Seedlings. (iv) Arabica selections. (v) and (vi) Age old (1·8 m.×1·8 m.). (vii) N.A. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) 250 cm. ; 281 cm. (xii) Dec. to March.

2. TREATMENTS :

6 cultural and manurial treatments : $T_0$=No mulching, $T_1$=Mulching with dry leaves at 125 Q/ha., $T_2$= Mulching with cherry husk at 125 Q/ha., $T_3$=Mulching with cherry husk at 250 Q/ha., $T_4$=Mulching with cherry husk at 250 Q/ha. in alternate rows and $T_5$=F.Y.M. at 250 Q/ha.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 15 plants. (Net) (v) Nil, (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of ripe cherry. (iv) (a) 1956-contd. (modified in 1963). (b) Yes, (c) Nil. (v) and (vi) Nil. (vii) Low yield in 1964 probably due to partial failure of blossom showers.

5. RESULTS :

**63(180)**

(i) 1421 gm./plant. (ii) 338·2 gm./plant. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in gm./plant.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1345 | 1596 | 1535 | 1346 | 1392 | 1310 |

**64(141)**

(i) 446 gm./plant. (ii) 244·4 gm./plant. (iii) Treatment differences are not significant. (iv) Av. yield of ripe cherry in gm./plant.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 276 | 526 | 644 | 358 | 394 | 480 |

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**Crop :- Coffee.** **Ref :- Ms. 64(138), 65(89).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'IM'.**

Object :—To study the response of young Coffee to sprinkler irrigation when applied at different times in relation to fertilizer application.

1. BASAL CONDITIONS :

(i) Jungle was cleand in 1955, terraced and planted Coffee S—795. (ii) Laterite. (iii) Seedlings. (iv) S—795 Arabica. (v) Planted in 1955 (1·5 m.×1·5 m.) (vi) One year. (vii) 50 Kg/ha. of $P_2O_5$+67 Kgs./ha. of $K_2O$ all plots. (viii) Weeding, shading and digging. (ix) Nil. (x) As per treatments. (xi) 281 cm.; N.A. (xii) October to December 1964 ; Jan. Feb. 1966.

TREATMENTS :

**Main plot treatments :**

4 irrigational treatments : $I_0$=$N_0$ irrigation, $I_1$=March irrigation, $I_2$=Feb.+March irrigation and $I_3$=Jan.+Feb.+March irrigation.

**Sub-plot treatments :**

3 levels of N : $N_1$=44·8, $N_2$=89·6 and $N_3$=134·4 Kg/ha.

One sprinkle unit was set up in each plot—2.5 cm. water applied through sprinkle each time.

3. DESIGN :

(i) Split plot. (ii) (a) 4 main plots/replication ; 3 sub-plots/main plot. (b) N.A. (iii) 4. (iv) (a) 3.7 m. ×14·6 m. (b) 16. (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of ripe cherry. (iv) (a) 1964 to 1968. (b) Yes. (c) Nil. (v) to (vii) Nil.

5, RESULTS :

**64(138)**

(i) 197 Kg/plot. (ii) (a) 139·7 Kg/plot. (b) 94·8 Kg/plot. (iii) None of the effects is significant. (iv) Av. yield. of ripe cherry in Kg/plot.

|  | $I_0$ | $I_1$ | $I_2$ | $I_3$ | Mean |
|---|---|---|---|---|---|
| $M_1$ | 210 | 191 | 189 | 208 | 200 |
| $M_2$ | 209 | 196 | 149 | 270 | 206 |
| $M_3$ | 233 | 171 | 172 | 169 | 186 |
| Mean | 217 | 186 | 170 | 216 | 197 |

65(89)

(i) 25·4 Kg/plot. (ii) (a) 6·5 Kg/plot. (b) 1·4 Kg/plot. (iii) None of the effects is significant. (iv) Av yield of ripe cherry in kg/plot.

| Treatment | $I_0$ | $I_1$ | $I_2$ | $I_3$ | $M_1$ | $M_2$ | $M_3$ | G.M. |
|---|---|---|---|---|---|---|---|---|
| Av. yield. | 29·4 | 29·4 | 21·7 | 20·0 | 26·5 | 27·2 | 22·4 | 25·4 |

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**Crop :- Coffee.** **Ref :- Ms. 61(246).**
**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'D'.**

Object :—To study the effect of insecticides on the mealy bug.

1. BASAL CONDITIONS :

(i) Jungle. (ii) N.A. (iii) Seedlings. (iv) Coorg Arabica. (v) to (vii) N.A. (viii) Weeding and digging. (ix)Nil. (x) Unirrigated. (xi) and (xii) N.A.

2 TREATMENTS :

9 insecticides : $I_0$=Control, $I_1$=Fosefesno 50 EC, $I_2$=Paramar 50 EC, $I_3$=Basudin 20 EC, $I_4$=Dieldrex 18 EC, $I_5$=Ekatox 50 EC, $I_6$=Malathion 53 EC, $I_7$=Gusathion 20 EC. and $I_8$=W.L. 1650 15 EC.

Treatments given separately at 0·02 % and 0·04 %a.c.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 4 plants/plot (Series I) and 3 plants/plot (Series II) (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) As per treatments (iii) Following the initial population recordings, observations on the intensity of bug population 5 cm. to 8 cm. below ground level were conduted during the intervals 7, 10 and 15 days after applying treatment. (iv) (a) No. (b) and (c) Nil. (v) No. (vi) Nil. (vii) Expt. conducted at Appies estate, S. Coorg.

5. RESULTS :

Mean percentage of bug population recorded after 15 days.
Series I (low concentration 0·02 a.c.)
(i) 52·0 % (ii) 8·1 % (iii) Treatment differences are highly significant. (iv) Av. percent of bug population.

| Treatment | $I_0$ | $I_1$ | $I_2$ | $I_3$ | $I_4$ | $I_5$ | $I_6$ | $I_7$ | $I_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. percent | 100.0 | 29·2 | 35·4 | 39·6 | 43·7 | 55·0 | 47·9 | 82·0 | 35·4 |

C.D.=14·02 percent.

Series II (high concentration 0·04 a.c.)
(i) 41·9 % (ii) 8·4 % (iii) Treatment differences are highly significant. (iv) Av. percent of bug population.

| Treatment | $I_0$ | $I_1$ | $I_2$ | $I_3$ | $I_4$ | $I_5$ | $I_6$ | $I_7$ | $I_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. percent. | 100·0 | 27·8 | 25·0 | 27·1 | 38·2 | 39·4 | 40·9 | 43·0 | 36·1 |

C.D.=14·6 percent.

**Crop :- Coffee.** **Ref :- Ms. 64(170).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'D'.**

Object :—To study the effect of insecticides on mealy bug.

## 1. BASAL CONDITIONS :

(i) Jungle. (ii) N.A. (iii Seedlings. (iv) Arabica (S—795). (v) N.A. (vi) ½ to 3 years old. (vii) N.A. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) 152 cm. (xii) December to March.

## 2. TREATMENTS :

4 insecticides : $I_0$=Control, $I_1$=Dimecron, $I_2$=Telodrin and $I_3$=Folidol.

[Treatments $I_1$ and $I_2$ supplimented with B.H.C. 5 % dust to control ants].

Two concentrations viz 0·01% and 0·02 % a.i. of the insecticides were tested in two adjacent but independent series. The diluted insecticides were applied as drench to the drip circle of the plants (2·5 litres/plant).

## 3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 10. (iv) (a) N.A. (b) 3. (v) Nil. (vi) yes.

## 4. GENERAL :

(i) Fair. (ii) As per treatments. (iii) % of infestation of mealy bug. (iv) (a) 1964—N.A. (b) and (c) Nil. (v) No. (vi) N.A. (vii) Expt. conducted at Chelangi estate, South Coorg.

## 5. RESULTS :

Mean % of infestation.

0·01 % a.i. 10 days.

(i) 27·7 % (ii) 1·1 % (iii) Treatment differences are significant. (iv) Av. percent of infestation.

| Treatment | $I_0$ | $I_1$ | $I_2$ | $I_3$ |
|---|---|---|---|---|
| Av. percent | 49·0 | 30·3 | 31·1 | 0·6 |

C.D.=1·0 %

0·01 % a.i. 21 days.

(i) 21·0 % (ii) 2·2 % (iii) Treatment differences are significant. (iv) Av. percent of infestation.

| Treatment | $I_0$ | $I_1$ | $I_2$ | $I_3$ |
|---|---|---|---|---|
| Av. percent | 40·8 | 9·3 | 32·4 | 1·5 |

C.D.=2·0 percent.

0·02 % a.i. 10 days.

(i) 18·6 % (ii) 1·8 % (iii) Treatment differences are significant. (iv) Av. percent of infestation.

| Treatment | $I_0$ | $I_1$ | $I_2$ | $I_3$ |
|---|---|---|---|---|
| Av. percent | 43·6 | 25·9 | 4·4 | 0·3 |

C.D.=1·7 percent.

0·02 % a.i. 21 days.

(i) 14·4 % (ii) N.A. (iii) Treatment differences are significant. (iv) Av. percent of infestation.

| Treatment | $I_0$ | $I_1$ | $I_2$ | $I_3$ |
|---|---|---|---|---|
| Av. percent | 44·9 | 0·4 | 12·0 | 0·2 |

**Crop :- Coffee.** **Ref :- Ms. 60(250).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'D'.**

Object :— To study the effect of insecticides on the incidence of shot hole borer.

1. BASAL CONDITIONS :

(i) Jungle. (ii) Nil. (iii) Seedlings. (iv) Robusta. (v) and (vi) N.A. (vii) Nil. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Nil.

2. TREATMENTS :

5 insecticides : $I_0$=Control (no insecticides), $I_1$=Dixldrin 0·2 a.c., $I_2$=Dixldrin 0·4 a.c., $I_3$=Gusathion 0·05 a.c. and $I_4$=Gusathion 0·1 a.c.

Six sprays during Sept., Oct., Nov., Dec. and Jun. 61 with Boadeaux mixture 2-2-40, ½%.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1 plant. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) As per treatments. (iii) Infestation perecentage. (iv) (a) to (c) Nil. (v) N.A. (vi) N.A. (vii) 50 tertiary branches of similar age were selected at random/plant for exhaustive counts on the total number of infestation and the stages intervals.

The effect of a particular treatment was assessed not only in terms of the degree of damage tunnels producted by the beetles, but also in terms of the number of stages developing with in such tunnels. Expt. conducted at Madbur estate, Koppa zone.

5. RESULTS :

(i) 3·5 %. (ii) 1·5%. (iii) Treatment differences are highly significant. (iv) Mean % of infestation.

| Treatment | $I_0$ | $I_1$ | $I_2$ | $I_3$ | $I_4$ |
|---|---|---|---|---|---|
| Mean percentage | 5·7 | 2·7 | 3·2 | 2·2 | 3·7 |

C.D.=1·9 percent.

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**Crop :- Coffee.** **Ref :- Ms. 60(251).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'D'.**

Object :—To compare the efficacy of proprietary fungicides with Bordeanx mixture.

1. BASAL CONDITIONS :

(i) Jungle. (ii) N.A. (iii) Seedlings. (iv) Robusta. (v) to (vii) N.A. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Dec. to March.

2. TREATMENTS :

4 fungicides : $T_1$=Colloidal Copper 0·45 Kg. in water —2 sprays, $T_2$=Bordeaux 0·5 %+Tenac sticker-2 sprays, $T_3$=Cobredon 500 gm. in 18.2 litres of water-2 sprays and $T_4$=Bordeaux 0·5 %—2 sprays.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 64 plants (net). (v) Yes (Details N.A.). (vi) Yes.

4. GENERAL :

(i) Fair. (ii) As per treatmenls. (iv) (a) 1958 to 1960.(b) and (c)Nil. (v) No. (vi) Nil. (vii) Raw data N.A.

1. RESULTS:

Effective % of leaf survival (Sept. 1960).

(i) 47·0 %. (ii) 12·2 %. (iii) Treatment differences are not significant. (iv) Av. % of leaf survival.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. percentage | 41·7 | 45·9 | 51·8 | 48·9 |

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**Crop :- Coffee.** **Ref :- Ms. 60(255).**

**Site :- Coffee Res. Stn., Balehonnur.** **Type :- 'D'.**

Object :— To compare the efficacy of proprietary fungicides with Bordeaux mixture.

1. BASAL CONDITIONS :

(i) Jungle. (ii) N.A. (iii) Seedlings. (iv) Robusta. (v) Old plantation. (vi) and (vii) N.A. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Dec. to March.

2. TREATMENTS :

4 fungicides : $T_1$=Flit 406 0·4% —2 sprays, $T_2$=Bordeaux mixture 0·5% —2 sprays, $T_3$=As in $T_2$+ Tenac sticker —2 sprays and $T_4$=Cupricol 0·5 Kg. in 18·2 litres of water —2 sprays.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 54 (18×3). (v) 2 rows around each plot. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) As per treatments. (iii) Effective % of leaf survival. (iv) (a) 1959 to 1960. (b) Yes. (c) Nil. (v) No. (vi) N.A. (vii) Raw data N.A. Expt. conducted at Cheekanahally estate, Chikmagalur zone.

5. RESULTS :

Effective % of leaf survival (Feb. 1960).

(i) 56·5 %. (ii) 9·6 %. (iii) Treatment differences are not significant. (iv) Av. % of leaf survival.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. percentage | 60·6 | 51·9 | 58·5 | 55·0 |

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**Crop -- Coffee.** **Ref :- Ms. 60(253).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'D'.**

Object :—To compare the efficacy of proprietary fungicides with Bordeaux mixture.

1. BASAL CONDITIONS :

(i) Jungle. (ii) N.A. (iii) Seedlings. (iv) Robusta. (v) Old plantation. (vi) and (vii) N.A. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Dec. to March.

2. TREATMENTS :

4 fungicides : $T_1$=Cupricol 0·5 Kg. in 18 litres of water—2 sprays, $T_2$=Kirti copper 0·5 Kg. in 18 litres of water—2 sprays, $T_3$=Micro Cop. 0·5 Kg. in 18 litres of water—2 sprays and $T_4$=Bordeaux mixture 2—2—40—2 sprays.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 54 (18×3). (v) and (vi) Yes.

4. GENERAL :

(i) Fair. (ii) As per treatments. (iii) Effective % of leaf survival. (iv) (a) 1958 to 60. (b) Yes. (c) Nil. (v) No. (vi) N.A. (vii) Raw data N.A. Expt. conducted at Wood Pandi estate, Coonoor.

5. RESULTS :

Effective % of leaf survival.

(i) 56·5%. (ii) 8·7 %. (iii) Treatment differences are not significant. (iv) Av. % of leaf survival.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. percentage | 57·5 | 51·2 | 54·5 | 62·8 |

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**Crop :- Coffee.** **Ref :- Ms. 60(254).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'D'.**

Object :—To compare the efficacy of proprietary fungicides with Bordeaux mixture.

1. BASAL CONDITIONS :

(i) Jungle. (ii) N.A. (iii) Seedlings. (iv) Robusta. (v) to (vii) N.A. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Dec. to March.

2. TREATMENTS :

4 fungicides : $T_1$=Parry Copper 50—0·5 Kg. in 182 litres of water—2 sprays, $T_2$=Bordeaux mixture 0·5% in 182 litres of water—2 sprays, $T_3$=Cobredon 0·5 Kg. in 182 litres of water 2 sprays and $T_4$=Kirti copper 0·5 Kg. in 182 litres of water—2 sprays.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 54 (18×3). (v) 2 rows around each plot. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) As per treatments. (iii) Effective % of leaf survival. (iv) (a) 1959 to 61. (b) Yes. (c) Nil. (v) No. (vi) Nil. (vii) Raw data N.A. Expt. conducted at Vasanthacool estate, Chickmagalur.

5. RESULTS :

Effective % of leaf survival Feb. 1960.

(i) 48·2 %. (ii) 8·9 %. (iii) Treatment differences are not significant. (iv) Av. % of leaf survival.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. percent | 41·2 | 49·0 | 53·9 | 48·6 |

Post monsoon 1961

(i) 34·7 %. (ii) 10·2 %. (iii) Treatment differences are not significant. (iv) Av. % of leaf survival.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. percent | 22·8 | 31·0 | 41·7 | 43·3 |

**Crop :- Coffee.** **Ref :- Ms. 60(252).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'D'.**

Object :—To compare the efficacy of proprietory fungicides with Bordeaux mixture.

1. BASAL CONDITIONS :

(i) Jungle. (ii) N.A. (iii) Seedlings. (iv) Robusta. (v) to (vii) N.A. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) N.A. (xii) Dec. to March.

2. TREATMENTS :

3 fungicides : $T_1$=Bordeaux mixture 0·5 %—2 sprays, $T_2$=Flit 406 0·4 %—2 sprays, $T_3$=Parry cop. 50—0·45 Kg. in 188 litres of water—2 sprays.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 54 (18×3) net. (v) Yes (details N.A.) (vi) Yes.

4. GENERAL :

(i) Fair. (ii) As per treatments. (iii) % of leaf survival. (iv) (a) 1958 to 61. (b) Yes. (c) Nil. (v) No. (vi) Nil. (vii) Experiment conducted at Bonaventinga estate

5. RESULTS :

Effective % of leaf survival.

Sept. 1960

(i) 58·2 %. (ii) 6·5 %. (iii) Treatment differences are not significant. (iv) Mean % of leaf survival.

| Treatment | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|
| Av. percentage | 63·1 | 60·5 | 51·0 |

Pre monsoon 1961

(i) 7·3 %. (ii) 7·2 %. (iii) Treatment differences are not significant. (iv) Mean % of leaf survival.

| Treatment | $T_1$ | $T_2$ | $T_3$ |
|---|---|---|---|
| Av. percentage | 9·1 | 6·9 | 5·9 |

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**Crop :- Coffee.** **Ref :- Ms. 60(249).**

**Site :- Central Coffee Res. Instt., Balehonnur.** **Type :- 'D'.**

Object :—To study the effect of insecticides on green bug (0·02 % and 0·04 %).

1. BASAL CONDITIONS :

(i) Jungle. (ii) N.A. (iii) Seedlings. (iv) Robusta. (v) to (vii) N.A. (viii) Weeding and digging. (ix) Nil. (x) Unirrigated. (xi) 254 cm. (xii) Nil.

2. TREATMENTS :

9 insecticides : $T_0$=Control (no insecticide), $T_1$=Basudin 2 EC., $T_2$=Malathion 53 EC., $T_3$=Paramar 50 EC., $T_4$=Fosferro 50 EC., $T_5$=Meta-150- Systex 25 EC., $T_6$=Ekatin 20 EC., $T_7$= Ekatox 50 EC., and $T_8$=Rogor 40 EC.

Treatments at high and low concentration separately (0·02 a.c. and 0·04 a.c.)

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 2. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) As per treatments. (iii) % reduction. (iv) (a) to (c) Nil. (v) No. (vi) N.A. (vii) On each plant 3 pairs of leaves carrying heavy infestation of green bug were selected at random in each pair, one leaf was used for vertical population count on the petiole, upper and lower surfaces during initial and post treatment observations. Thus 6 leaves were counted per treatment in an observation. Post treatment observations were conducted at the periods 10, 20 and 30 days. Expt. conducted at Madbur estate, Koppa zone.

5. RESULTS :

Mean % reduction obtained at 30 days after treatment.

Low concentration 0·02 a.c.

(i) 88·1 %. (ii) 8·8 %. (iii) Treatment differences are highly significant. (iv) Av. % of reduction.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. Percentage | 0·0 | 97·6 | 98·6 | 100·0 | 100·0 | 99·5 | 99·1 | 99·9 | 98·8 |

C.D.=10·3 %.

High concentration 0·04 a.c.

(i) 86·2 %. (ii) 6·1 %. (iii) Treatment differences are highly significant. (iv) Av. % of reduction.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|---|
| Av. percentage | 0·0 | 96·8 | 99·9 | 100·0 | 99·9 | 89·9 | 96·5 | 100·0 | 92·3 |

C.D.=7·1 %.

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**Crop :- Coffee.** **Ref :- Ms. 60(139, 141), 61(126 to 128).**

**Site :- Central Coffee Res. Stn., Chethally.** **Type :- 'D'.**

Object :— To compare the efficacy of proprietory fungicides with Bordeaux mixture.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Laterite, Sandy loam. (iii) By seedlings. (iv) Local. (v) Transplanting ; N.A. (vi) to (viii) N.A. (ix) Nil. (x) Unirrigated. (xi) 242 cm. ; 228 cm. (xii) N.A.

2. TREATMENT :

8 fungicidal treatments : $T_0$=Control, $T_1$=500 gm. of cobredon, $T_2$=500 gm. of cuprical Hb., $T_3$=500 gm. of parry cop, $T_4$=Dithane M-22-0·4%, $T_5$=Bordeaux mixture—·5%, $T_6$=Bordeaux mixture ·5%+Titron X-114, and $T_7$=Dithane M-22 0·4%+Titron X-114.

The above fungicides were applied in 18·8 litres of water and 3 sprayings.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 9 plants (gross), middle plants (net). (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) As per treatments. (iii) Effective % of leaves/plant survived. (iv) (a) 1959-N.A. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Plot wise yield data were not available at the Res. Stn.

5. RESULTS :

**60(139) February.**

(i) 49·1 % of leaves/plant. (ii) 4·9 % of leaves/plant. (iii) Treatment differences are not significant. (iv) Av. % of leaves/plant survived.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. percent | 49·2 | 45·8 | 52·5 | 42·5 | 52·9 | 44.1 | 57·8 | 48·7 |

**60(141) September**

(i) 33·4 % of leaves/plant. (ii) 6·6 % of leaves/plant. (iii) Treatment differences are not significant. (iv) Av. percent of leaves/plant survived.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. percent | 28·9 | 40·3 | 25·0 | 40·8 | 35·2 | 45·4 | 42·8 | 29·1 |

**61(126) February.**

(i) 76·6 % of leaves/plant. (ii) 10·4 % of leaves/plant. (iii) Treatment differences are not significant. (iv) Av. % of leaves/plant survived.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. percent | 78·2 | 76·5 | 73·5 | 79·2 | 73·7 | 79·6 | 77·5 | 74·5 |

**61(127) Pre-monsoon**

(i) 61·3 % of leaves/plant. (ii) 9·5 % of leaves/plant. (iii) Treatment differences are not significant. (iv) Av. % of leaves/plant survived.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. percent | 62·1 | 57·0 | 72·0 | 65·3 | 78·8 | 55·7 | 49·8 | 50·0 |

**61(128) Post-monsoon.**

(i) 80·9 % of leaves/plant. (ii) 6·7 % of leaves/plant. (iii) Treatment differences are not significant. (iv) Av. % of leaves/plant survived.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|---|
| Av. percent | 99·3 | 89·3 | 86·9 | 71·7 | 85·6 | 63·6 | 80·4 | 70·7 |

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**Crop :- Coffee.** **Ref :- Ms. 60(140), 61(129).**

**Site :- Central Coffee Res. Stn., Chethally:** **Type :- 'D'.**

Object :— To study the effect of spraying fungicides on Berry Blotch disease.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Lateritic ; Sandy loam. (iii) By seedlings. (iv) Local. (v) Transplanting. (vi) to (viii) N.A. (ix) Nil. (x) Unirrigated. (xi) 243 cm. ; 228 cm. (xii) N.A.

2. TREATMENTS :

5 fungicidal treatments : $T_0$=Control, $T_1$=Bordeaux 0·5 %, $T_2$=Bordeaux 1 %, $T_3$=Bordeaux 2 % and $T_4$=Flit 406-0·4 %.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) and (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) As per treatments. (iii) Percentage of disease incidence/plant. (iv) (a) 1960-N.A. (b) Yes. (c) Nil. (v) and (vi) N.A. (vii) Raw data were not available at the Res. Stn.

5. RESULTS :

**60(140)**

(i) 15·6 % disease/plant. (ii) 1·7 % disease/plant. (iii) Treatment differences are significant. (iv) Av. % disease incidence/plant.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. percentage | 34·8 | 10·7 | 17·3 | 5·9 | 19·2 |

C.D.=2·7 %

**61(129)**

(i) 26·2 % of disease/plant. (ii) 7·7 % of disease/plant. (iii) Treatment differences are highly significant. (iv) Av. percentage of disease incidence/plant.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|---|
| Av. precentage | 64·0 | 16·2 | 8·4 | 5·0 | 37·6 |

C.D.=11·8 %

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**Crop :- Coffee.** **Ref :- Ms. 60(138), 61(125, 130, 131).**

**Site :- Central Coffee Res. Stn., Chethally.** **Type :- 'D'.**

Object :—To compare the efficacy of proprietory fungicides with Bordeaux mixture.

1. BASAL CONDITIONS :

(i) Forest area. (ii) Lateritic ; Sandy loam. (iii) By seedlings. (iv) Local. (v) to (viii) N.A. (ix) Nil. (x) Unirrigated. (xi) 343 cm. ; 228 cm. (xii) N.A.

2. TREATMENTS :

4 fungicidal treatments : $T_1$=454 gm. of microp in 18·8 litres of water, $T_2$=Bordeaux mixture 0·5 %, $T_3$= 454 gm. of colloidol cooper in 18·8 litres of water and $T_4$=454 gm. of ultra sulphur in 273 litres of water.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 100 plants (groos) ; 54 plants (net). (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) As per treatments. (iii) Effective percentage of leaf survival. (iv) (a) 1958-N.A. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Plot wise yield data were not available at the Res. Stn.

5. RESULTS :

**60(138)**

(i) 37·0 % of leaves/plant. (ii) 5·7 % of leaves/plant. (iii) Treatment differences are not significant. (iv) Av. percentage of leaf survival/plant.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. percentage | 36·4 | 37·2 | 4·4 | 32·9 |

**61(125) February**

(i) 84·0 % of leaves/plant. (ii) 2·6 % of leaves/plant. (iii) Treatment differences are not significant. (iv) Av. percentage of leaf survival/plant.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. percentage | 81·5 | 83·4 | 86·1 | 85·1 |

**6 (130) pre-monsoon**

(i) 41·9 % of leaves/plant. (ii) 11·0 % of leaves/plant. (iii) Treatment differences are not significant. (iv) Av. percentage of leaf survival/plant.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. percentage | 48·6 | 36·2 | 45·7 | 37·1 |

**61(131) Post-monsoen.**

(i) 86·0 % of leaves/plant. (ii) 3·7 % of leaves/plant. (iii) Treatment differences are not significant. (iv) Av. % of leaf survival/plant.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. percentage | 89·4 | 76·6 | 88·9 | 89·3 |

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**Crop :- Cashewnut.** **Ref :- Ms. 62(100), 63(100), 64(69), 65(83).**

**Site :- Central Cashewnut Res. Stn., Ullal.** **Type :- 'C'.**

Object :— To devise a suitable method of training Cashewnut trees so as to get a strong and permanent frame work.

1. BASAL CONDITIONS :

(i) Fallow grass growing land. (ii) Latritic. (iii) By seedlings. (iv) Local. (v) Date of sowing N.A., raising seedlings, preparation of polythene bags for sowing of seeds with soil mixture and seeds were soaked in water. (vi) 2 to 3 months. (vii) A/S, Super, Mur. Pot. (doses N.A.) were applied. (viii) Loosening the soil, digging pits, spreading soil around the plants. Removal of diseased and dead wood from established plants. (ix) Nil. (x) Unirrigated. (xi) 407 cm. ; 360 cm. ; 282 cm. ; 303 cm. (xii) March, April for 62, 63, 64 ; Feb. to May for 65.

2. TREATMENTS :

3 types of trainning trees : $T_0$=Control, $T_1$=Modified leader and $T_2$=Leader type.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 24·4 m.×6·1 m. (b) N.A. (v) 40 trees. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of cashewnut. (iv) (a) 1958-contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

**62(100)**

(i) 25·6 Kg/ha. (ii) 16·7 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of cashewnut in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ |
|---|---|---|---|
| Av. yield | 38·6 | 8·8 | 29·4 |

C D.=21·5 Kg./ha.

**63(100)**

(i) 24·8 Kg/ha. (ii) 72·8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cashewnut in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ |
|---|---|---|---|
| Av. yield | 46·5 | 3·3 | 24·5 |

**64(69)**

(i) 134·1 Kg/ha. (ii) 75·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cashewnut in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ |
|---|---|---|---|
| Av. yield | 194 | 106 | 101 |

**65(83)**

(i) 356 Kg/ha. (ii) 268·9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cashewnut in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ |
|---|---|---|---|
| Av. yield | 455 | 335 | 277 |

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**Crop :- Cashewnut.** **Ref :- Ms. 61(16), 62(99), 63(101), 64(68), 65(82).**

**Site :- Central Cashewnut Res. Stn., Ullal.** **Type :- 'C'.**

Object :—To study the orchard performance of layers, grafts and seedlings.

1. BASAL CONDITIONS:

(i) Fallow grass growing land. (ii) Laterite. (iii) As per treatments. (iv) Local. (v) 22.6.1957 ; with spacing 6·1 m.×6·1 m. (vi) 2 to 3 months. (vii) 1 Kg/pit of ash was applied at the time of refilling of pits for 61 ; A/S, Super, Mur. Pot. (dose N.A.) for 62, 63, 64; 79 Kg/ha. of A/S+124 Kg/ha. of Super+28 Kg/ha. of Mur .pot. for 65. (viii) Nil for 61, 65 ; loosening the soil and spreading the soil around the plants for others. (ix) Nil. (x) Unirrigated. (xi) 357 cm. ; 407 cm. ; 360 cm. ; 282 cm. ; 303 cm. (xii) Feb. to May for 61, 65 ; March—April for others.

2. TREATMENTS:

3 methods of propagation : $M_1$=Layers, $M_2$=Grafts and $M_3$=Seedlings.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 36·6 m.×6·1 m. (b) 6. (v) 46 guard trees kept around the entire area. (vi) Yes.

4. GENERAL ;

(i) Good. (ii) Nil. (iii) Yield of cashewnut, height and spread of plants. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

**61(16)**

(i) 101 Kg/ha. (ii) 53·3 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of cashewnut in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ |
|---|---|---|---|
| Av. yield | 129 | 158 | 17 |

C.D.=68·6 Kg/ha.

**62(99)**

(i) 244 Kg/ha. (ii) 70·3 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of cashewnut in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ |
|---|---|---|---|
| Av. yield | 361 | 251 | 120 |

C.D.=90·5 Kg/ha.

**63(101)**

(i) 235 Kg/ha. (ii) 90·6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of cashewnut in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ |
|---|---|---|---|
| Av. yield | 327 | 309 | 70 |

C.D.=116·5 Kg/ha.

64(68)

(i) 202 Kg/ha. (ii) 65·1 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of cashewnut in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ |
|---|---|---|---|
| Av. yield | 272 | 250 | 83 |

C.D.=83·8 Kg/ha.

65(82)

(i) 305 Kg/ha. (ii) 192·5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of cashewnut in Kg/ha.

| Treatment | $M_1$ | $M_2$ | $M_3$ |
|---|---|---|---|
| Av. yield | 334 | 348 | 233 |

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**Crop :- Cashewnut,** **Ref :- Ms. 61(95), 62(101), 63(99), 64(67).**

**Site :- Central Cashewnut Res. Stn., Ullal.** **Type :- 'IM'.**

Object :—To accelerate the growth of Cashewnut seedlings by manurial and irrigational treatments.

1. BASAL CONDITIONS ;

(i) Grass growing fallow land. (ii) Laterite. (iii) By seedlings. (iv) Local. (v) Raising, seedlings, preparation of polythene bags, sowing of seeds, filling with soil mixture and seeds were soaked in water. (vi) 2 to 3 months. (vii) A/S, Super and Mur. pot were applied (doses N.A.). (viii) Loosening the soil, digging pits, spreading soil around the plants, removal of diseased and dead wood in established plants. (ix) Nil. (x) As per treatments. (xi) 576 cm. ; 407 cm. ; 360 cm. ; 282 cm. (xii) March—April.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 manurial treatments : $M_0$=Control, $M_1$=113 gm. of N+57 gm. of $P_2O_5$+57 gm. of $K_2O$ and $M_2$=227 gm. of N+113 gm. of $P_2O_5$+113 gm. of $K_2O$.

(2) 2 irrigational treatments : $I_0$=No irrigation and $I_1$=Irrigation thrice a week from January to April.

Each of the above treatment combination were applied to two rows of 5 seedlings each.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 2. (iv) (a) 30·5 m.×6·1 m. (b) 5. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Copper fungicide were sprayed with combination spray and insecticides like folidol. 605 EC. and B.H.C. 50% WP. against control of fungal disease. (iv) (a) 1958—contd. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Data were not recorded for 1960.

5. RESULTS :

61(95)

(i) 174 Kg/ha. (ii) 108·7 Kg/ha. (iii) Main effect of M alone is significant. (iv) Av. yield of cashewnut in Kg/ha.

|  | $M_0$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|
| $I_0$ | 0 | 108 | 381 | 163 |
| $I_1$ | 0 | 219 | 333 | 184 |
| Mean | 0 | 164 | 357 | 174 |

C.D. for M marginal means=197·6 Kg/ha.

62(101)

(i) 87 Kg/ha. (ii) 75·7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of cashewnut in Kg/ha.

| | $M_0$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|
| $I_0$ | 0 | 82 | 111 | 64 |
| $I_1$ | 27 | 130 | 171 | 109 |
| Mean | 14 | 106 | 141 | 87 |

63(99)

(i) 112 Kg/ha. (ii) 79·1 Kg/ha. (iii) Main effect of M alone is significant. (iv) Av. yield of cashewnut in Kg/ha.

| | $M_0$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|
| $I_0$ | 0 | 214 | 142 | 119 |
| $I_1$ | 0 | 92 | 227 | 106 |
| Mean | 0 | 153 | 184 | 112 |

C.D. for M marginal means=143·8 Kg/ha.

64(67)

(i) 229 Kg/ha. (ii) 144·8 Kg/ha. (iii) Main effect of M alone is significant. (iv) Av. yield of cashewnut in Kg/ha.

| | $M_0$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|
| $I_0$ | 4 | 401 | 191 | 199 |
| $I_1$ | 6 | 311 | 462 | 260 |
| Mean | 5 | 356 | 326 | 229 |

C.D. for M marginal means=263·3 Kg/ha.

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**Crop :- Arecanut.** **Ref :- 60(176), 61(177), 62(159), 63(159).**

**Site :- Reg. Arecanut Res. Stn., Thirthahally.** **Type :- 'M'.**

Object :—To find out the effect of application of lime with manures on the yield of Arecanut.

1. BASAL CONDITIONS :

(i) Under arecanut cultivation. (ii) Laterite. (iii) Seedlings. (iv) Local. (v) Old garden with spacing 305 cm. × 244 cm. (vi) 2½ years. (vii) Nil in 1960, 1961 ; 22·7 Kg/ha. of N+18·1 Kg. of $P_2O_5$+34·0 Kg. of $K_2O$ per 500 palm+13·6 Kg. of F.Y.M.+13·6 Kg. of G.L./palm in 1962 and F.Y.M. applied in 1963 (details N.A.) (viii) Light digging and weeding. (ix) Banana. (x) Irrigated. (xi) 277 cm. ; 500 cm. ; 355 cm. ; 287 cm. (xii) 1.11.1960 to 2.1.61 ; Nov. 1961 to Jan. 1962 ; Nov. 1962 ; Sep. 1963 to Jan. 64.

### 2. TREATMENTS :

2 Treatments :

**Main-plot treatments :**

3 manurial treatments : $M_1$=Bulk manure once in 3 years, $M_2$=Fertilizers every year and $M_3$= $M_1+M_2$.

**Sub-plot treatments :**

2 levels of lime : $L_0$=No lime and $L_1$=0·45 Kg. of lime/tree.

Bulk manure : 13·6 Kg. of F.Y.M.+13·6 Kg. of green leaves/palm and Fertilizers : 56·0 Kg/ha. of N. (½ as G.N.C. and ½ as A/S) +84·0 Kg/ha. of $P_2O_5$ as Super+112·1 Kg/ha. of $K_2O$ as Mur. Pot.

### 3. DESIGN :

(i)Split-plot. (ii) (a) 3 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 121·4 sq. m. (b) 12. (v) Nil. (vi) Yes.

### 4. GENERAL :

(i) Normal. (ii) Nil. Bordeaux mixture sprayed in 1960 ; Nil in 1961 and 1963 ; and plants affected with Kalerogam. Bordeaux mixture sprayed in 1962. (iii) Dry arecanut yield. (iv) (a) 1954 to 1963. (b) Yes. (c) Nil. (v) No. (vi) and (vii) Nil.

### 5. RESULTS :

60(176)

(i) 0·75 Kg/tree. (ii) (a) 0·19 Kg/tree. (b) 0·13 Kg/tree. (iii) Main effect of L is highly significant. (iv) Av. yield of arecanut in Kg/tree.

| | $M_1$ | $M_2$ | $M_3$ | Mean |
|---|---|---|---|---|
| $L_0$ | 0·65 | 0·62 | 0·59 | 0·62 |
| $L_1$ | 0·75 | 0·90 | 0·99 | 0·88 |
| Mean | 0·70 | 0·76 | 0·79 | 0·75 |

C.D. for L marginal means=0·11 Kg/ha.

61(177)

(i) 1·13 Kg/tree. (ii) (a) 0·33 Kg/tree. (b) 0·15 Kg/tree. (iii) Main effect of M is significant. (iv) Av. yield of arecanut in Kg/ tree.

| | $M_1$ | $M_2$ | $M_3$ | Mean |
|---|---|---|---|---|
| $L_0$ | 0·87 | 1·08 | 1·39 | 1·11 |
| $L_1$ | 0·80 | 1·22 | 1·41 | 1·14 |
| Mean | 0·84 | 1·15 | 1·40 | 1·13 |

C.D. of M marginal means=0·39 Kg/ha.

62(159)

(i) 0·86 Kg/tree. (ii) (a) 0·20 Kg/tree. (b) 0·18 Kg/tree. (iii) Main effect of M is significant. (iv) Av. yield of arecanut in Kg/tree.

| | $M_1$ | $M_2$ | $M_3$ | Mean |
|---|---|---|---|---|
| $L_0$ | 0·66 | 0·89 | 1·02 | 0·86 |
| $L_1$ | 0·64 | 0·90 | 1·04 | 0·86 |
| Mean | 0·65 | 0·90 | 1·03 | 0·86 |

C.D. of M marginal means=0·24 Kg/tree.

63(159)

(i) 0·90 Kg/tree. (ii) (a) 0·20 Kg/tree. (b) 0·13 Kg/tree. (iii) None of the effects is significant. (iv) Av. yield of arecanut in Kg/tree.

| | $M_1$ | $M_2$ | $M_3$ | Mean |
|---|---|---|---|---|
| $L_0$ | 0·84 | 0·81 | 0·98 | 0·88 |
| $L_1$ | 0·76 | 1·08 | 0·96 | 0·93 |
| Mean | 0·80 | 0·94 | 0·97 | 0·90 |

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**Crop :- Arecanut.** **Ref :- Ms. 60(174), 61(175), 62(162).**

**Site :- Reg. Arecanut Res. Stn., Thirthahally.** **Type :- 'M'.**

Object :—To study the residual effect of of N, P and K applied during 1959 on the yield of Arecanut.

1. BASAL CONDITIONS :

(i) Land was under arecanut for a long time. (ii) Laterite. (iii) Seedlings. (iv) Local. (v) Old age garden. (vi) 2½ years. (vii) Bulk manure at 14 Kg. of F.Y.M. and 14 Kg. of G.L./palm in 1960, 1961 ; and 22·7 Kg/ha. of N+18·1 Kg of $P_2O_5$+34·0 Kg of $K_2O$ per 500 palms+13·6 Kg. of F.Y.M. and G.L./palm. (viii) Weeding once a month and light digging. (ix) Banana. (x) Irrigated. (xi) 277 cm. ; 500 cm. ; 355 cm. (xii) 1.2.60 to 2.1.1961 ; N.A ; Nov. 1962.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N (½ as A/S+ ½ as G.N.C.) : $N_0$=0, $N_1$=33·6 and $N_2$=67·2 Kg/ha.
(2) 3 levels of $P_2O_5$ as Super : $P_0$=0, $P_1$=44·8 and $P_2$=89·7 Kg/ha.
(3) 3 levels of $K_2O$ as Mur. Pot. : $K_0$=0, $K_1$=56·0 and $K_2$=112·1 Kg/ha.

3. DESIGN :

(i) $3^3$ confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 3 for 60 and 4 for 61 and 62. (iv) (a) 121·4 Sq. m. (b) 12. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. Bordeaux mixture sprayed against ply. (iii) Dry weight of arecanut. (iv) (a) 1954 to 62. (b) Yes. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

60(174)

(i) 749 Kg/ha. (ii) 220·5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of arecanut in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 843 | 778 | 768 | 849 | 701 | 838 | 796 |
| $N_1$ | 704 | 717 | 693 | 722 | 768 | 625 | 705 |
| $N_2$ | 724 | 746 | 764 | 713 | 742 | 779 | 745 |
| Mean | 757 | 747 | 742 | 761 | 737 | 747 | 749 |
| $K_0$ | 875 | 756 | 652 | | | | |
| $K_1$ | 658 | 801 | 752 | | | | |
| $K_2$ | 737 | 684 | 821 | | | | |

61(175)

(i) 801 Kg/ha. (ii) 265·2 Kg/ha. (iii) Interaction P×K alone is significant. (iv) Av. yield of arecanut in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 897 | 664 | 780 | 888 | 677 | 776 | 780 |
| $N_1$ | 870 | 690 | 829 | 744 | 829 | 819 | 796 |
| $N_2$ | 852 | 838 | 793 | 816 | 865 | 803 | 828 |
| Mean | 873 | 731 | 801 | 816 | 790 | 798 | 801 |
| $K_0$ | 924 | 749 | 776 | | | | |
| $K_1$ | 717 | 825 | 829 | | | | |
| $K_2$ | 977 | 619 | 798 | | | | |

C.D. for the body of P×K table=88·3 Kg/ha.

62(162)

(i) 663 Kg/ha. (ii) 197·6 Kg/ha. (iii) Interaction N×P×K alone is significant. (iv) Av. yield of arecanut in Kg/ha.

| | $P_0$ | $P_1$ | $P_2$ | $K_0$ | $K_1$ | $K_2$ | Mean |
|---|---|---|---|---|---|---|---|
| $N_0$ | 652 | 652 | 633 | 662 | 662 | 613 | 646 |
| $N_1$ | 593 | 702 | 662 | 702 | 633 | 623 | 652 |
| $N_2$ | 741 | 622 | 672 | 712 | 692 | 672 | 692 |
| Mean | 662 | 672 | 656 | 692 | 662 | 636 | 663 |
| $K_0$ | 662 | 702 | 712 | | | | |
| $K_1$ | 613 | 771 | 603 | | | | |
| $K_2$ | 712 | 544 | 652 | | | | |

* * *

**Crop :- Arecanut.** **Ref :- Ms. 60(175), 61(176), 62 (158).**

**Site :- Arecanut Res. Stn., Thirthahally.** **Type :- 'M'.**

Object :—To study the effect of organic and inorganic manures at different intervals of application.

1. BASAL CONDITIONS :

(i) Under arecanut cultivation for a long time. (ii) Laterite. (iii) Seedlings. (iv) Local. (v) Old garden. (vi) $2\frac{1}{2}$ years. (vii) Nil in 1960, 1961 ; 56 Kg. of N+84 Kg. of $P_2O_5$+112 kg. of $K_2O$ per 500 palm +13·6 Kg. F.Y.M. per palm applied uniformly during 1962. (viii) Light digging and weeding. (ix) Banana. (x) Irrigated. (xi) 277 cm. ; 500 cm. ; 355 cm. (xii) 1.12.1960. to 2.1.1961 ; Nov. 1961 to Jan. 1962; Nov. 1962.

## 2. TREATMENTS :

**Main-plot treatments :**

4 organic manurial treatments : $M_0$=No bulk manure, $M_1$=Bulk manure every year, $M_2$=Bulk manure once in 2 years and $M_3$=Bulk manure once in 3 years.

**Sub plot treatments :**

4 inorganic manurial treatments : $T_0$=No artificial manure, $T_1$=Manure once in a year, $T_2$=Once in 2 years and $T_3$=Once in 3 years.

Bulk manure : 13·6 Kg. of F.Y.M.+13·6 Kg. of G. L. per palm and artificial manure : 56·0 Kg/ha. of N (28·0 Kg/ha. as G.N.C.+28·0 Kg/ha. as A/S)+84·0 Kg/ha. of $P_2O_5$ as Super+112·1 Kg/ha. of $K_2O$ as Mur. Pot.

## 3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 121·4 Sq. m. (b) 12. (v) Nil. (vi) Yes.

## 4. GENERAL :

(i) Normal. (ii) Bordeaux mixture sprayed against ply to pethore arecanut in 1960 ; N.A. for others. (iii) Green and dry weight of arecanut. (iv) (a) 1954 to 1962. (b) Yes. (c) Nil. (v) N.A. (vi) and (vii) Nil.

## 5. RESULTS :

**60(175)**

(i) 0.57 Kg/tree. (ii) (a) 0·29 Kg/tree. (b) 0·13 Kg./tree. (iii) Main effect of T is highly significant and interaction T×M is significant. (iv) Av. yield of dry arecanut in Kg/tree.

| | $T_0$ | $T_1$ | $T_2$ | $T_3$ | Mean |
|---|---|---|---|---|---|
| $M_0$ | 0·46 | 0·40 | 0·62 | 0·49 | 0·49 |
| $M_1$ | 0·62 | 0·71 | 0·53 | 0·60 | 0·62 |
| $M_2$ | 0·47 | 0·62 | 0·66 | 0.63 | 0·60 |
| $M_3$ | 0·50 | 0·72 | 0·67 | 0.40 | 0·57 |
| Mean | 0·51 | 0·61 | 0·62 | 0·53 | 0·57 |

C.D. for T marginal means=0·08 Kg./tree.
C.D. for T means at the same level of M=0·18 Kg/tree.
C.D. for M means at the same level of T=0·28 Kg/tree.

**61(176)**

(i) 0·90 Kg/tree. (ii) (a) 0·27 Kg/tree. (b) 0·34 Kg/tree. (iii) None of the effects is significant. (iv) Av. yield of dry arecanut in Kg/tree.

| | $T_0$ | $T_1$ | $T_2$ | $T_3$ | Mean |
|---|---|---|---|---|---|
| $M_0$ | 0·85 | 1·21 | 0·73 | 10·3 | 0·95 |
| $M_1$ | 1·01 | 0·81 | 1·10 | 1·07 | 1·00 |
| $M_2$ | 0·74 | 0·91 | 0·89 | 0·84 | 0·85 |
| $M_3$ | 0·78 | 0·93 | 0·76 | 0·78 | 0·81 |
| Mean | 0·85 | 0·96 | 0·87 | 0·93 | 0·90 |

**62(158)**

(i) 0·90 Kg/tree. (ii) (a) 0·28 Kg/tree. (b) 0·83 Kg/tree. (iii) None of the effects is significant. (iv) Av. yield of dry arecanut in Kg/tree.

| | $T_0$ | $T_1$ | $T_2$ | $T_3$ | Mean |
|---|---|---|---|---|---|
| $M_0$ | 0·61 | 0·69 | 0·78 | 0·65 | 0·68 |
| $M_1$ | 0·82 | 0·95 | 0·75 | 0·93 | 0·86 |
| $M_2$ | 0·98 | 1·03 | 1·20 | 0·92 | 1·03 |
| $M_3$ | 0·91 | 0·93 | 1·20 | 1·03 | 1·02 |
| Mean | 0·83 | 0·90 | 0·98 | 0·88 | 0·90 |

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**Crop :- Arecanut.** **Ref :- Ms. 65(58).**

**Site :- Arecanut Res. Stn., Vittal.** **Type :- 'M'.**

Object :—To study the effect of applying N, P and K' fertilizers in organic and inorganic forms on palm performance.

1. BASAL CONDITIONS :

(i) Fallow land. (ii) Laterite. (iii) Seedlings. (iv) Areca Catechu. (v) Planted in Oct. 1958 (3·7 m.× 3·7 m). (vi) 1½ years. (vii) 12 Kg. of G.L.+12 Kg. of compost/palm. (viii) Weeding and digging. (ix) Nil. (x) Irrigated. (xi) 264 cm. (xii) N.A.

2. TREATMENTS :

4 different methods of application of manures : $T_1$=In organic form from 6th to 15th year, $T_2$=In inorganic form from 6th to 15 years, $T_3$=In organic form from 6th to 10th year and then in inorganic form upto 15th year and $T_4$=In inorganic form from 6th to 10th year and then in organic form up to 15th year.

Manures applied : 25 Kg. of N+25 Kg. of $P_2O_5$+40 Kg. of $K_2O$ per 500 palms per year.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 0·01 Ha. (b) 6. (v) One raw. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Sprayed Bordeaux mixture as a precautionary measure. (iii) Arecanut yield data. (iv) (a) 1963 to 1970 (b) Yes. (c) Nil. (v) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 4198 Kg/ha. (ii) 867·1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of arecanut in Kg/ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. yield | 4484 | 3972 | 3661 | 4676 |

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**Crop :- Arecanut.** **Ref :- Ms. 65(3).**

**Site :- Arecanut Res. Stn., Hirehally.** **Type :- 'C'.**

Object :—To determine optimum spacing in the main field for Arecanut.

1. BASAL CONDITIONS :

(i) Fallow. (ii) Clayey to clayey loam. (iii) Seedlings. (iv) Areca catichu. (v) 25.9.1961. (vi) 1½ year. (vii) N, P, K in the ratio of 61·7 : 61·7 : 98·8 Kg/ha. respectively (viii) Digging and weeding once in a year. (ix) Nil. (x) Irrigated. (xi) 79 cm. (xii) July to December 65(observation taken).

2. TREATMENTS :

6 spacings : $S_1$=1·8 m. × 1·8 m., $S_2$=1·8 m. × 2·7 m., $S_3$=1·8 m. × 3·7 m., $S_4$=2·7 m. × 2·7 m., $S_5$=2·7 m. × 3·7 m. and $S_6$=3·7 m. × 3·7 m.

3 DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 11·0 m. × 22·0 m. (b) 20. (v) One common row al-round. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Mites in the summer season controlled by spraying of Trithion or Kethan (dose 1·3 m.l. in 1 litre of water). (iii) Girth and no. of leaves/palm. (iv) (a) 1961—contd. (b) Yes (c) Nil. (v) No. (vi) and (vii) Nil.

5. RESULTS :

Leaves/palm

(i) 6·6 leaves/palm. (ii) 0·4 leaves/palm. (iii) Treatment differences are not significant. (iv) Av. no. of leaves/palm.

| Treatment | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ |
|---|---|---|---|---|---|---|
| Av. number | 6·8 | 6·9 | 6·8 | 6·6 | 6·2 | 6·3 |

Grith in cm./palm

(i) 37·4 cm./palm. (ii) 3·0 cm./palm. (iii) Treatment differences are not significant. (iv) Av. girth in cm./palm.

| Treatment | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | $S_6$ |
|---|---|---|---|---|---|---|
| Av. girth | 37·9 | 38·2 | 36·8 | 38·6 | 37·9 | 34·7 |

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**Crop :- Arecanut.** **Ref :- Ms. 61(174), 62(156), 63(160), 64(126), 65(67).**
**Site :- Reg. Arecanut Res.** **Type :- 'C'.**
**Stn., Thirthahally.**

Object :—To investigate the possibilities of growing inter crops with Arecanut and their economics.

1. BASAL CONDITIONS :

(i) Old garden. (ii) Laterite with mixture of sand. (iii) Seedlings. (iv) Local. (v) and (vi) Old garden. (vii) 22·7 Kg. of N+18·1 Kg. of $P_2O_5$+34·0 Kg. of $K_2O$ per 500 palm+14 Kg. of F.Y.M./palm in the month of May 1961, 1962 ; 22·7 Kg. of N+18·1 Kg. of $P_2O_5$+34·0 Kg. of $K_2O$ for 400 palms applied during 1963 ; 25·3 Kg. of N+20·8 Kg. of $P_2O_5$+36·7 Kg. of $K_2O$ per 500 palms in June 1964 and 1965 ; half the dose applied in 1965 to inter crops in 1965. (viii) Weeding once in two weeks. (ix) As per treatments. (x) Irrigated. (x) 500 cm. ; 355 cm. : 287 cm. ; 314 cm. and about 200 cm. (xii) N.A. ; Dec. 1962 ; Nov. 1963 to Jan. 1964 ; Oct. to Dec. 1964 and Oct. to Dec. 1965.

2. TREATMENTS :

6 inter crops : $T_0$=Control, $T_1$= Banana, $T_2$=Pineapple, $T_3$=Cardamom, $T_4$=Pepper and $T_5$=Betal-vine.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) N.A. for the years 1961 to 1964 and 243·8 m. × 914·4 m. for 1965. (b) N.A. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Affected with "Kalerogam", sprayed bordeaux mixture in 1961 ; Nil in 1962 ; N.A. for others. (iii) Dry weight of arecanut. (iv) (a) 1961 – contd. (b) Yes. (c) Nil. (v) No. (vi) and (vii) Nil.

5. RESULTS :

**61(174)**

(i) 0·8 Kg/tree. (ii) 0.2 Kg/tree. (iii) Treatment differences are significant. (iv) Av. yield of arecanut in Kg/tree.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1·0 | 0·7 | 0·7 | 0·8 | 0.5 | 1·1 |

C.D. = 0·4 Kg/tree.

**62(156)**

(i) 0·9 Kg/tree. (ii) 0·3 Kg/tree. (iii) Treatment differences are not significant. (iv) Av. yield of arecanut in Kg/tree.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1·1 | 0·8 | 0·7 | 1·0 | 0·7 | 1·0 |

**63(160)**

(i) 1·1 Kg/tree. (ii) 0·3 Kg/tree. (iii) Treatment differences are not significant. (iv) Av. yield of arecanut in Kg/tree.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1·3 | 0·9 | 1·1 | 1·2 | 0·9 | 1·4 |

64(126)

(i) 1·1 Kg/tree. (ii) 0·3 Kg/tree. (iii) Treetment differences are not significant. (iv) Av. yield of arecanut in Kg/tree.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 1·3 | 0·9 | 1·1 | 1·1 | 0·8 | 1·3 |

65(67)

(i) 428·7 Kg/ha. (ii) 243·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of arecanut in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|---|
| Av. yield | 770·4 | 290·4 | 400·3 | 361·0 | 454·1 | 296·0 |

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**Crop :- Arecanut.** **Ref :- Ms. 61(173), 62(157), 63(163), 64(121), 65(66).**

**Site :- Reg. Arecanut Res. Stn., Thirthahally.** **Type :- 'C'.**

Object :—To study the suitability of growing G.M. and cover crops in the arecanut garden and their effect on the yield of Arecanut.

1. BASAL CONDITIONS :

(i) Old age garden, manures applied once in 2 years. (ii) Laterite. (iii) Seedlings. (iv) Local. (v) Old age garden ; G.M. seeds by broadcasting on 22.9.1961. (vi) Old garden. (vii) 22·7 Kg. of N+18·1 Kg. of $P_2O_5$+34·0 Kg. of $K_2O$ per 500 palm in 1961, 63 ; nil in 1962 ; 13·6 Kg. of F.Y.M. per palm during July 1963 and 1965 ; 25·3 Kg. of N+20·8 Kg. of $P_2O_5$+36·7 Kg. of $K_2O$ per 500 palms in 1964 and 65. (viii) Weeding once in a fortnight and digging. (ix) As per treatments. (x) Irrigated. (xi) 500 cm. ; 355 cm. ; 287 cm. ; 314 cm. ; 200 cm. (xii) 18.12.1961 ; Dec. 1962 ; Nov. 1963 to Jan. 1964 ; Nov. to Dec. 1964.

2. TREATMENTS :

7 intercropping of G.M. : $T_0$=Control, $T_1$=Pharoria phosedloides, $T_2$=Calapagonium mucunoides, $T_3$=Centroseme pubeaseens, $T_4$=Tephrosia candida, $T_5$=Crotalaria stricata and $T_6$=Crotalaria anagyroides.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 12·2 m.×2·4 m. (b) N.A. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Affected with Kalerogam—bordeaux mixture sprayed in 1961, 62; N.A. for others. (iii) Dry weight of arecanut. (iv) (a) 1961—contd. (b) Yes. (c) Nil. (v) No. (vi) N.A. (vii) Nil.

5. RESULTS :

61(173)

(i) 4·3 Kg/tree. (ii) 1·4 Kg/tree. (iii) Treatment differences are not significant. (iv) Av. yield of dry arecanut in Kg/tree.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 5·2 | 4·4 | 3·7 | 3·9 | 4·1 | 4·2 | 4·5 |

62(157)

(i) 0·7 Kg/tree. (ii) 0·2 Kg/tree. (iii) Treatment differences are not significant. (iv) Av. yield of dry arecanut in Kg/tree.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 0·6 | 0·7 | 0·7 | 0·7 | 0·7 | 0·6 | 0·6 |

63(163)

(i) 0·9 Kg/tree. (ii) 0·6 Kg/tree. (iii) Treatment differences are not significant. (iv) Av. yield of dry arecanut in Kg/tree.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 1·0 | 1·0 | 1·1 | 0·9 | 0·8 | 1·0 | 0·9 |

64(121)

(i) 0·8 Kg/tree. (ii) 0·2 Kg/tree. (iii) Treatment differences are not significant. (iv) Av. yield of dry arecanut in Kg/tree.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 0·7 | 0·8 | 0·8 | 0·7 | 0·7 | 1·1 | 0·8 |

65(66)

(i) 271·9 Kg/ha. (ii) 105·9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of dry arecanut in Kg/ha.

| Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|---|
| Av. yield | 312·9 | 251·5 | 312·9 | 284·3 | 270·0 | 224·5 | 247·2 |

**Crop :- Coconut.** **Ref :- Ms. 64(173), 64(174).**

**Site :- Coconut Res. Stn., Arsikere.** **Type :- 'CM'.**

Object :—To study the effect of different spacings and manures on Coconut seedlings.

1. BASAL CONDITIONS :

(i) Jungle. (ii) Red ; Medium black. (b) N.A. (iii) Seedlings. (iv) Local tall. (v) 19.8.64 ; 24.8.1964. Spacings as per treatments (vi) One year. (vii) Nil. (viii) Ploughing and interculturing. (ix) G.M. crop. (x) Unirrigated. (xi) 768 cm. (xii) 25.8.65 ; 31.8.1965.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 spacings : $S_1$=7·3 m.×7·3 m. and $S_2$=9·8 m.×9·8 m.

(2) 3 manures : $M_0$=Control (no manure), $M_1$=0·112 Kg. of N+0·112 Kg. of $P_2O_5$ and 0·224 Kg. of $K_2O$ per seedling and $M_2$=Twice of $M_1$.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 4 to 9. (v) One row alround. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Height of coconut seedlings. (iv) (a) 1964–contd. (b) N.A. (c) Nil. (v) No. (vi) and (vii) Nil.

5. RESULTS :

64(173)

(i) 109 cm./plant. (ii) 12·8 cm./plant. (iii) None of the effects is significant. (iv) Av. height/plant in cm.

| | $M_0$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|
| $S_1$ | 113 | 99 | 119 | 110 |
| $S_2$ | 107 | 107 | 110 | 108 |
| Mean | 110 | 103 | 114 | 109 |

64(174)

(i) 113 cm./plant. (ii) 13·3 cm./plant. (iii) None of the effects is significant. (iv) Av. height/plant in cm.

| | $M_0$ | $M_1$ | $M_2$ | Mean |
|---|---|---|---|---|
| $S_1$ | 125 | 112 | 112 | 116 |
| $S_2$ | 111 | 170 | 96 | 109 |
| Mean | 118 | 116 | 104 | 113 |

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**Crop :- As Per Treatments (*Rabi*).** **Ref :- Ms. 63(249), 65(81).**

**Site :- Agri. Res. Stn., Bagalkot.** **Type :- 'X'.**

Object :—To study the effect of mixed cropping along with Cotton.

1. BASAL CONDITIONS :

(i) (a) and (b) *Jowar*. (c) N.A. (ii) Deep black. (iii) N.A. (iv) (a) Ploughing and harrowing. (b) Dibbling. (c) 7·4 Kg/ha. (d) 45 cm.×61 cm. (e) N.A. (v) 12·4 C.L./ha. of F.Y.M. for all crops, 25 Kg/ha. of N+25 Kg/ha. of $P_2O_5$ for Cotton, 15 Kg/ha. of N+15 Kg/ha. of $P_2O_5$ for Setaria and 10 Kg/ha. of N+10 Kg/ha. of $P_2O_5$ for Suyadhar. (vi) Cotton—Suyadhar ; Sateria—H-2. (vii) Unirrigated. (viii) Weeding, interculturing etc. (ix) 43 cm ; 26 cm. (x) N.A.

2. TREATMENTS :

6 mixed croppings : $T_1$=Entire Cotton, sown in normal, time, $T_2$=Entire groundnut followed by wheat in the same year, $T_3$=Cotton and groundnut in 1 : 1 ratio, $T_4$=Cotton and groundnut in 1 : 2 ratio, $T_5$=Cotton and *Korra* in 1 : 1 ratio and $T_6$=Cotton and *Korra* in 1 : 2 ratio.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 9·1 m.×5·5 m. (b) 8·5 m.×4·9 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield data. (iv) (a) 1963 to 65. (b) No. As under 5. Results. (v) and (vi) N.A. (vii) Data for 1964 N.A. Error variances are homogeneous. Treatments×years interaction is present.

5. RESULTS :

(i) 294 Kg/ha. (ii) 269·2 Kg/ha. (based on 5 d.f. made up of Treatments×years interaction). (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs./ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ |
|---|---|---|---|---|---|---|
| Av. value | 330 | 177 | 336 | 296 | 346 | 282 |

| Years | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|
| 1963 | 464 | 119 | 379 | 297 | 280 | 228 | ** | 294 | 51.8 |
| 1965 | 197 | 235 | 293 | 296 | 411 | 337 | ** | 295 | 66·3 |
| Pooled | 330 | 177 | 336 | 296 | 346 | 282 | N.S. | 294 | 269·2 |

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**Crop :- Groundnut and Jowar (*Kharif*).** **Ref -: Ms. 64(18).**

**Site :- Reg. Sorghum Res. Stn., Bailhongal.** **Type :- 'X'.**

Object :—To study the effect of intercropping hybrid *Jowar* with Groundnut.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) *Bengal* gram. (c) 12·4 C.L./ha. of F.Y.M. (ii) Light Masari. (iii) 3.7.1964. (iv) (a) One ploughing and 6 harrowings. (b) Drilling. (c) to (e) N.A. (v) 12·4 C.L./ha. of F.Y.M. prior to sowing, 22·4 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ as Nitro Phos. at the time of sowing. (vi) Groundnut : Spanish improved (early) ;Hybrid *Jowar* : MS×IS.—3691 (early). (vii) Unirrigated. (viii) 2 intercultivations and 2 weedings. (ix) 81 cm. (x) *Jowar* : 6.11.64 ; Groundnut : 23.10.64.

2. TREATMENTS:

8 ratios of rows for sowing (Groundnut : *Jowar*) : $R_1$=1 : 0, $R_2$=0 : 1, $R_3$=1 : 1, $R_4$=2 : 2, $R_5$=2 : 1, $R_6$=4 : 2, $R_7$=3: 1 and $R_3$=6 : 2.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) 87·8 m.×9·8 m. (iii) 4. (iv) (a) 11·0 m.×9·8 m. (b) 9·1 m.×7·3 m. (v) 91 cm.×122 cm. (vi) Yes.

4. GENERAL :

(i) Normal growth for Groundnut. Due to asmy worm *Jowar* crop suffered. (ii) *Jowar* was attacked with asmy worm. Folidol 4 cc. in 18 litres of water was sprayed at first time. B.H.C. 10% and folidol 2% dust with ratio of 3 : 1 was dusted @ 22·4 Kg/ha. (iii) Yield of grain and pods. (iv) (a) and (b) No. (c) Nil (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 580 Rs./ha. (ii) 113·8 Rs./ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./ha.

| Treatment | $R_1$ | $R_2$ | $R_3$ | $R_4$ | $R_5$ | $R_6$ | $R_7$ | $R_8$ |
|---|---|---|---|---|---|---|---|---|
| Av. value | 779 | 259 | 523 | 452 | 591 | 623 | 685 | 776 |

C.D.=167·4 Rs./ha.

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**Crop :- Jowar and Bengal gram** (*Rabi*). **Ref :- Ms. 64(156).**

**Site :- Soil Conservation Res. Stn., Bellary.** **Type :- 'X'.**

Object: —To study the economic feasibility of mixed sowing *Jowar* and Bengal gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Setaria. (c) Nil. (ii) Deep black cotton soil. (iii) *Jowar* on 3.10.64; Bengal gram on 4.10.64. (iv) (a) Light harrowing. (b) Dibbling. (c) N.A. (d) 46 cm.×23 cm. (e) One. (v) Nil. (vi) *Jowar* M-47-3 (early) and Bengal gram BG-482. (vii) Unirrigated. (viii) Weeding and hand hoeing. (ix) 16 cm. (x) *Jowar* on 6.2.65 and Bengal gram on 23.1.65.

2. TREATMENTS :

4 mixed cropping treatments : $T_1$=*Jowar* at 91 cm. apart with one row of Bengal gram, $T_2$=Pure *Jowar* at 91 cm. apart, $T_3$=Pure *Jowar* at 46 cm. apart and $T_4$=Pure Bengal gram at 46 cm. apart.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) 14·6 m.×9·1 m. (iii) 6. (iv) (a) and (b) 7·3 m.×4·6 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) *Jowar*—Satisfactory ; Bengal gram—poor. (ii) Nil. (iii) *Jowar*—height, no. of leaves, leaf area, yield; Bengal gram—no. of pods and pod yield. (iv) (a) 1963 to 64. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Expt. failed in 1963.

5. RESULTS :

(i) 479 Rs./ha. (ii) 97·4 Rs./ha. (iii) Treatment differences are highly significant. (ix) Av. value of produce in Rs./ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| Av. value | 480 | 558 | 712 | 167 |

C.D.=119·9 Rs./ha.

**Crop :- Cotton & Bengal gram (*Rabi*).** **Ref :- Ms. 64(155).**
**Site :- Soil Conservation Res. Stn., Bellary.**

Object :—To find out the possibility of introducing intercropping in this tract.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Setaria. (c) Nil. (ii) Deep black cotton soil. (iii) Cotton on 20.9.64 and Bengal gram on 4.10.64. (iv) (a) Light harrowing. (b) Sowing by dibbling. (c) N.A. (d) Cotton—91 cm.×30 cm.; Bengal gram—46 cm.×23 cm. (v) Nil. (vi) Cotton—Western—1 (*Rabi*) ; Bengal gram—B.G. 482. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) Cotton 21 cm. and Bengal gram 14 cm. (x) Bengal gram on 23.1.65 ; Cotton N.A.

2. TREATMENTS :

5 mixed cropping treatments : $T_1$=Cotton 122 cm. apart with two rows of Bengal gram, $T_2$=Cotton 91 cm. apart with one row of Bengal gram, $T_3$=Pure Cotton 91 cm. apart, $T_4$=Pure Cotton 122 cm. apart and $T_5$=Pure Bengal gram 46 cm. apart.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) 20·0 m.×22·9 m. (iii) 4. (iv) (a) and (b) 11·0 m.×4·6 m. (v) Nil (vi) Yes.

4. GENERAL :

(i) The condition was not quite satisfactory. (ii) Nil. (iii) Yield of produce. (iv) (a) 1963-64. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Expt. failed in 1963.

5. RESULTS :

(i) 205 Rs./ha. (ii) 40·8 Rs./ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. value | 248 | 202 | 241 | 239 | 95 |

C.D.=62·9 Rs./ha.

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**Crop :- Grass & Legume.** **Ref :- Ms. 61(78), 62(94), 63(59).**
**Site :- Agri. College, Dharwar.** **Type :- 'X'.**

Object :—To find the suitable association of Grass and Legumes.

1. BASAL CONDITIONS :

(i) Black kulti during previous season. (ii) Red light soil. (iii) N.A. (iv) Grass—Thin Napier ; Legumes—Centrosema. (v) Transplanting on 14, 15.8.61. (vi) N.A. (vii) 12·4 C.L./ha. of F.Y.M. Spread and mixed by means of a harrow. (viii) 1 to 2 hand weedings and 2 to 4 interculturings. (ix) Nil. (x) Unirrigated. (xi) N.A. ; 87 cm. ; N.A. (xii) 3 cuttings on 24.11.1961, 30.12.1961 and 11.6.1962 ; 17.10.1962 and 18.1.1963 ; 27.8.1963 and 4.11.1963.

2. TREATMENTS :

4 Grass—Legume mixtures : $C_1$=Mixed sowing of grass one row and legume one row, $C_2$=One grass and one legume within the row, $C_3$=Legume seeds dibbled 15 cm. away from the grass seedlings within the row and $C_4$=Entire grass.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 11·0 m.×3·7 m. (b) N.A. (v) 61 cm.×61 cm. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Height, breadth, no. of tillers, leaf to stem ratio and monetary value. (iv) (a) 1961—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

61(78)

(i) 265 Rs./ha. (ii) 7·1 Rs./ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs./ha.

| Treatment | $C_1$ | $C_2$ | $C_3$ | $C_4$ |
|---|---|---|---|---|
| Av. value | 269 | 222 | 250 | 318 |

62(94)

(i) 803 Rs./ha. (ii) 148·5 Rs./ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs./ha.

| Treatment | $C_1$ | $C_2$ | $C_3$ | $C_4$ |
|---|---|---|---|---|
| Av. value | 810 | 717 | 840 | 843 |

63(59)

(i) 539 Rs./ha. (ii) 36·7 Rs./ha. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs./ha.

| Treatment | $C_1$ | $C_2$ | $C_3$ | $C_4$ |
|---|---|---|---|---|
| Av. value | 552 | 572 | 503 | 528 |

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**Crop :- Grass and Legume.** **Ref :- Ms. 60(80).**

**Site :- Agri. College, Dharwar.** **Type :- 'X'.**

Object :—To study the effective method of establishing the land with suitable Grass and Legume mixtures.

1. BASAL CONDITIONS :

(i) Since 1954 to 1958, the land was under grass museum and manured. (ii) Red light soil. (iii) N.A. (iv) As per treatments. (v) August 1958 ; method of sowing as per treatments. (vi) N.A. (vii) 12·4 C.L./ha. of F.Y.M. and 33·6 Kg/ha. of N+22·4 Kg/ha. of $P_2O_5$ as top dressing—hand spread and mixed by means of hoes. (viii) Light ploughing, interculturings and hand weeding. (ix) As per treatments. (x) N.A. (xi) 99 cm. (xii) 2 to 3 cuttings were taken according to seasonal varieties.

2. TREATMENTS :

**Main-plot treatments :**

2 methods of sowing : $M_1$=Sowing by seed drill and $M_2$=Broadcasting.

**Sub-plot treatments :**

All combinations of (1) and (2)

(1) 3 species of grasses : $G_1$=Thin napier, $G_2$=Rhodes and $G_3$=Blue panic.

(2) 3 species of legumes : $L_1$=Calapogonium arecunoides, $L_2$=Centrosome and $L_3$= Borbada.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 9 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 4·6 m.× 3·7 m. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) Nil. (iii) Grass and legumes yield and money value of the produce. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 214 Rs./ha. (ii) (a) 73·2 Rs./ha. (b) 44·8 Rs./ha. (iii) Main effects of L and G are highly significant. (iv) Av. value of produce in Rs./ha.

| | $G_1$ | $G_2$ | $G_3$ | $L_1$ | $L_2$ | $L_3$ | Mean |
|---|---|---|---|---|---|---|---|
| $M_1$ | 445 | 174 | 130 | 213 | 334 | 203 | 250 |
| $M_2$ | 312 | 127 | 94 | 155 | 214 | 163 | 178 |
| Mean | 379 | 150 | 112 | 184 | 274 | 183 | 214 |
| $L_1$ | 351 | 131 | 71 | | | | |
| $L_2$ | 426 | 195 | 200 | | | | |
| $L_3$ | 259 | 125 | 66 | | | | |

C.D. for L or G marginal means=30·3 Rs./ha.

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**Crop :- Grass and Legume.** **Ref :- Ms. 60(79).**

**Site :- Agri. College, Dharwar.** **Type :- 'X'.**

Object :—To determine the effect on the yield of growing Grass and Legume as mixture in different proportions.

1. BASAL CONDITIONS :

(i) Land used as a grazing land until 1955 when the grass was planted. Since 1955, no manuring was done. (ii) Red light soil. (iii) N.A. (iv) Grass—Thin napier ; Legumes—Calapogonium. (v) August 1955. (vi) N.A. (vii) Nil. (viii) Interculturing, hand weeding and gap filling. (ix) Nil. (x) Unirrigated (xi) 99 cm. (xii) 2 to 3 cuttings.

2. TREATMENTS :

6 ratios of grass and legume mixture: $R_1$=Grass alone, $R_2$=Legume alone, $R_3$=Grass and legume in the ratio 1 : 1, $R_4$=Grass and legume in the ratio 2 : 1, $R_5$=Grass and legume in the ratio 3 : 1 and $R_6$=Grass and legume in the ratio 5:1.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 6·1 m.×4·3 m. (b) N.A. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Not satisfactory. (ii) Nil. (iii) Yield and money value of the produce. (iv) (a) 1955 to 1960. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

(i) 384 Rs./ha. (ii) 50·1 Rs./ha. (iii) Treatment differences are highly significant. (iv) Av. value of produce Rs./ha.

| Treatment | $R_1$ | $R_2$ | $R_3$ | $R_4$ | $R_5$ | $R_6$ |
|---|---|---|---|---|---|---|
| Av. value | 406 | 58 | 462 | 449 | 421 | 508 |

C.D.=75·3 Rs./ha.

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**Crop :- As Per Treatments.** **Ref :- Ms. 63(76), 64(55).**

**Site :- Agri. College, Dharwar.** **Type :- 'X'.**

Object :—To study suitable crops which can be grown as mixed crops with errect type of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Cotton, chilly, groundnut. (b) Chilly—cotton. (c) Chilly—22·4 Kg/ha. of N+16·8 Kg/ha. of $P_2O_5$ and Cotton—11·2 Kg/ha. of N+16·8 Kg/ha. of $P_2O_5$. (ii) Medium black. (iii) 16.7.1963; 3.7.1964. (iv) (a) One ploughing with wooden plough. (b) to (e) N.A. (v) Nil. (vi) Spanish improved (medium). (vii) Unirrigated. (viii) 2 interculturings and 2 hand weedings. (ix) 69 cm. ; 69 cm. (x) 24.10.1963 ; 24.10.1964.

2. TREATMENTS :

7 cultural operations : $C_1$=Groundnut alone 30 cm. apart, $C_2$=Groundnut alone 61 cm. apart, $C_3$= Groundnut+Cotton, $C_4$=Groundnut+*Rala*, $C_5$=Groundnut+*Tur*, $C_6$=Groundnut +*Bajra* and $C_7$=Groundnut+*Jowar*.

From $C_3$ to $C_7$, crops were mixed in 2 : 1 ratio. Distance between cotton plants was 91 cm.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 9·1 m.×7·3 m. (b) 8·5 m.×6·7 m. (v) 30 m.×30 m. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Germination count, no of braches and yield data. (iv) (a) 1963—contd. (b) no. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are homogeneous. Treatments × Years interaction is present.

5. RESULTS:

(i) 932 Rs./ha. (ii) 342·8 Rs./ha. (based on 6 d.f. made up of Treatments × years interaction). (iii) Treatment differences are significant. (iv) Av. value of produce in Rs./ha.

| Treatment | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ | $C_6$ | $C_7$ |
|---|---|---|---|---|---|---|---|
| Av. value | 1028 | 843 | 1404 | 736 | 1034 | 649 | 832 |

C.D.=419·4 Rs./ha.

| Years | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ | $C_6$ | $C_7$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1963 | 990 | 902 | 1698 | 805 | 1136 | 634 | 1058 | ** | 1032 | 191·4 |
| 1964 | 1065 | 784 | 1111 | 668 | 931 | 664 | 606 | ** | 833 | 151·4 |
| Pooled | 1028 | 843 | 1404 | 736 | 1034 | 649 | 832 | * | 932 | 342·8 |

**Crop :- Ragi. and Legumes (*Kharif*).** **Ref :- Ms. 60(24), 6I(67).**

**Site :—Agri. Res. Stn., Hebbal.** **Type :- 'X'.**

Object :—To find out suitable legume mixture for *Ragi*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Ragi. (b) 9·9 C.L./ha. of F.Y.M. in 1960 ; 7·1 C.L./ha. of compost in 1961. (ii) Sandy loam. (iii) 18.7.1960 ; 21.7.1961. (iv) (a) Ploughing and harrowing in 1960 ; 3 ploughings and 2 harrowings in 1961. (b) Drilling. (c) 7 Kg/ha. (d) 25 cm. between rows. (e) N.A. (v) 14·8 C.L./ha. of compost in 1960 and 7·4 C.L./ha. of compost in 1961 and 11·2 Kg/ha. of $P_2O_5$ before sowing+16·8 Kg/ha. of N one month after sowing as top dressing in both the years. (vi) H-22. (vii) Unirrigated. (viii) Weeding in 1960 ; thinning with Chippa kunta and hand weeding. (ix) 82 cm. ; 72 cm. (x) 29.11.1960 ; 7.12.1961.

2. TREATMENTS :

5 mixed cropping : $T_1$=Ragi+Horse gram, $T_2$=Ragi+Green gram, $T_3$=Ragi+Dholicose lab-lab (Avare), $T_4$=Ragi+Jhoga and $C_5$=Ragi alone.

3. DESIGN:

(i) R.B.D. in 1960 and L. sq. in 1961. (ii) (a) 5. (b) 29·9 m.×11·0 m. (iii) 5. (iv) (a) N.A., ; 12·2 m.×5·5 m. (b) 11·0 m.×5·5 m. ; 21·2 m.×5·5 m. (v) N.A. ; Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Tiller count and yield data in monetary value. (iv) (a) 1960 to 1962. (b) No. (c) As under 5. Results. (v) and (vi) Nil. (vii) Error variances are himogeneous. Treatments×Years interaction is present.

5. RESULTS :

(i) 999 Rs./ha. (ii) 379·0 Rs./ha. (based on 4 d.f. made up of Treatments×Years interaction). (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs./ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ |
|---|---|---|---|---|---|
| Av. value | 936 | 1040 | 1020 | 1024 | 974 |

| Years | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|
| 1960 | 753 | 995 | 1112 | 1085 | 1053 | ** | 1000 | 117·3 |
| 1961 | 1120 | 1086 | 927 | 995 | 863 | N.S. | 998 | 149·5 |
| Pooled | 936 | 1040 | 1020 | 1024 | 974 | N.S. | 999 | 379·0 |

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**Crop :- Jowar and Groundnut (*Kharif*).** **Ref :- 62(265), 63(225), 64(189).**

**Site :- Agri. Res. Stn., Raichur.** **Type :- 'X'.**

Object :—To study the economic feasibility of mixed cropping of *Jowar* and Groundnut.

1. BASAL CONDITIONS:

(i) (a) *Jowar*, Groundnut. (b) *Jowar*. (c) N.A. (ii) Red soil. (iii) 3.6.1962 ; 30.6.1963 ; N.A. (iv) (a) 2 wooden ploughings and 3 to 4 harrowings. (b) Drilling. (c) *Jowar*—6 to 7 Kg/ha; Groundnut—67 Kg/ha. (d) N.A. (e) —. (v) 12·4 C.L./ha. of F.Y.M. (vi) *Jowar*—D-3-40 ; Groundnut—TMV-2. (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 84 cm. ; 64 cm. ; 89 cm. (x) N.A. ; 17.12.1963 ; N.A.

2. TREATMENTS :

8 mixed cropping treatments : $T_1$=*Jowar* and Groundnut mixed in the ratio 1: 1, $T_2$=*Jowar* and Groundnut mixed in the ratio 2 : 1, $T_3$= *Jowar* and Groundnut mixed in the ratio 3 : $T^4$=*Jowar* and Groundnut 1 row each, $T_5$=2 rows of *Jowar* and 1 row of Groundnut, $T_6$=3 rows of *Jowar* and 1 row of Groundnut, $T_7$=Groundnut entire and $T_8$=*Jowar* entire.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 8.2 m.×12·2 m. in 1962 ; 5·5 m.×7·3 m. in 1963 and 1964. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Grain and pod yield. (iv) (a) 1962—N.A. (b) No. (c) As under 5. Results, (v) No. (vi) Nil. (vii) Error variances are heterogeneous. Treatments×years interaction is present.

5. RESULTS :

(i) 482 Rs./ha. (ii) 259·3 Rs./ha. (based on 14 d.f. made up of Treatments×Years interaction). (iii) Treatment differences are not significant. (iv) Av value of produce in Rs./ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ |
|---|---|---|---|---|---|---|---|---|
| Av. value | 542 | 552 | 433 | 474 | 417 | 526 | 596 | 320 |

| Years | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | 150 | 777 | 368 | 355 | 396 | 290 | 207 | 416 | ** | 370 | 111·3 |
| 1963 | 518 | 465 | 412 | 529 | 457 | 488 | 504 | 495 | N.S. | 471 | 98·6 |
| 1964 | 739 | 795 | 680 | 604 | 438 | 673 | 506 | 415 | N.S. | 606 | 290·0 |
| Pooled | 542 | 552 | 433 | 474 | 417 | 526 | 596 | 320 | N.S. | 482 | 259·3 |

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**Crop :- Jowar and Tur** (*Kharif*). **Ref :- Ms. 62(266), 63(226), 64(190).**

**Site :- Agri. Res. Stn., Raichur.** **Type :- 'X'.**

Object :—To find out the best and most economical mixture of *Tnr* and *Jowar* for dry cultivation.

1. BASAL CONDITIONS :

(i) (a) *Jowar*, *Tur*. (b) *Jowar*. (c) N.A. (ii) Red soil. (iii) 22.6.1962 ; 2.7.1963. (iv) (a) 2 wooden ploughings and 3 to 4 harrowings. (b) Drilling. (c) *Jowar*-6·7 Kg/ha; *Tur* 9-Kg/ha. (d) and (e) N.A. (v) 12·4 C.L./ha. of F.Y.M. (vi) Tur—C. 28 ; *Jowar* D-3-40. (vii) Unirrigated. (viii) Weeding and interculturing. (ix) 84 cm. ; 64 cm. ; 89 cm. (x) 15.1.1963 ; 13.1.1964 ; N.A.

2. TREATMENTS :

7 mixed cropping : $T_1$=12 rows of *Kharif Jowar* alone, $T_2$=12 rows of *Tur* alone, $T_3$=Alternate rows of *Jowar* and *Tur*, $T_4$=2 rows of *Jowar* and 1 row of *Tur*, $T_5$=3 rows of *Jowar* and 1 row of *Tur*, $T_6$=3/4 *Jowar*+1/4 *Tur* mixed (*Jowar* and *Tur* in 284 gm. : 35 gm.) and $T_7$=$\frac{1}{2}$ *Jowar*+$\frac{1}{2}$ *Tur* mixed (*Jowar* and *Tur* in 14 gm. : 21 gm.)

3. DESIGN :

(i) R.B.D. (ii) (a) 7., (b) N.A. (iii) 4. (iv) (a) 22·7 m.×5·5 m. ; 7·3 m.×5 5 m. in 1963, 1964. (b) 22·1 m.×4·6 m. ; 7·3 m.×5·5. in 1963, 1964. (v) 30 cm. ×46 cm. for 63 ; Nil for 64. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield data. (iv) (a) 1961 – N.A. (b) No. (c) As under 5. Results. (v) N.A. (vi) Nil. (vii) Error variances are heterogeneous. Treatments × Years interaction is present. Only the expt. for 63 and 64 have been pooled. Expt. for 1962 has not pooled as the treatment no. 4, failed.

5. RESULTS :

(i) 618 Rs./ha. (ii) 479·2 Rs./ha. (based on 6 d.f. made up of Treatments × Years interaction). (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs./ha.

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ |
|---|---|---|---|---|---|---|---|
| Av. value | 501 | 586 | 690 | 834 | 683 | 347 | 686 |

| Years | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | Sig. | G.M. | S.E./plot |
|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | 28 | 649 | 503 | — | 336 | 332 | 365 | ** | 369 | 69·7 |
| 1963 | 242 | 396 | 417 | 464 | 487 | 487 | 345 | ** | 405 | 79·6 |
| 1964 | 760 | 776 | 962 | 1204 | 878 | 207 | 1027 | ** | 831 | 309·8 |

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**Crop :-** Jowar, **Groundnut and Cotton.** **Ref :- Ms. 60(105), 61(79), 62(91), 63(90).**

**Site :- Agri. Res. Stn., Saundathi** **Type :- 'R'.**

Object :—To find out a suitable rotation for cotton with and without a lagume in the rotation.

1. BASAL CONDITIONS :

(i) (a) to (c) As per treatments. (ii) Medium black. (iii) *Jowar* and Groundnut 9.7.60., cotton N.A. ; 6.7.61 to 23.8.61 ; *Jowar* 5.7.62, Groundnut 4.7.62, cotton 22.8.62 ; *Jowar* 30.6.63; Groundnut 30.6.63; cotton 24.8.63. (iv) (a) 3 harrowings for *Jowar* and Groundnut and 4 harrowings for cotton. (b) Sown by drill (c) *Jowar* 7 Kg/ha., groundnut 112 Kg/ha., cotton 11 Kg/ha. (d) *Jowar* 30 cm. × 10 cm. ; groundnut 30 cm. × 15 cm. ; cotton 61 cm. × 15 cm. (e) N.A. (v) Nil. (vi) *Jowar*-Fulgar white ; Groundnut—spanish improved—Cotton—Jayodhar. (vii) Unirrigated. (viii) 3 to 4 interculturings. (ix) N.A. (x) *Jowar* 27.12.60, groundnut 3.11.60, cotton N.A. ; 31.12.61 to 21.4.62. ; 4.1.63 to 15.3.63 ; N.A.

2. TREATMENTS :

| The cycle of rotations | | | | | | The cycle of rotations | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Treatment No. | 1960 | 1961 | 1962 | 1963 | 1964 | Treatment No. | | | | |
| 1. | Cm | Cm | Cm | Cm | | 17. | G | Jm | G | Jm |
| 2. | C | Cm | C | Cm | | 18. | Jm | G | Jm | G |
| 3. | Cm | C | Cm | C | | 19. | Gp | J | Gp | J |
| 4. | Jm | Jm | Jm | Jm | | 20. | J | Gp | J | Gp |
| 5. | J | Jm | J | Jm | | 21. | C | Jm | G | C |
| 6. | Jm | J | Jm | J | | 22. | Jm | G | C | Jm |
| 7. | Jm | C | Jm | C | | 23. | G | C | Jm | G |
| 8. | C | Jm | C | Jm | | 24. | Jm | C | G | Jm |
| 9. | G | C | G | C | | 25. | C | G | Jm | C |
| 10. | C | G | C | G | | 26. | G | Jm | C | G |
| 11. | G | Cm | G | Cm | | 27. | C | Jm | Gp | C |
| 12. | Cm | G | Cm | G | | 28. | Jm | Gp | C | Jm |
| 13. | Gp | C | Gp | Cp | | 29. | Gp | C | Jm | Gp |
| 14. | C | Gp | C | G | | 30. | Jm | Cp | Gp | Jm |
| 15. | G | J | G | J | | 31. | C | G | Jm | C |
| 16. | J | G | J | G | | 32. | Gp | Jm | C | Gd |

C=Cotton, J=*Jowar*, G=Groundnut, m= 12·35 C.L./ha. of F.Y.M. and p= 44·8 Kg/ha. of $P_2O_5$. Details of treatments for the years 1951 to 1953 and 1954 to 1959 may please be referred to on page 441 of Vol. IX, part I and on page 738 of vol. IX part II respectively.

3. DESIGN :

(i) R.B.D. (ii) (a) 32. (b) 141 m.×57·3 m. (iii) 6. (iv) (a) 17·6 m.×8·2 m. (b) Varying from treatment to treatment. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) N.A. (iii) Yield of *Jowar*, Groundnut and Cotton. (iv) (a) 1951—63. (b) As per rotations. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

**60(105)**

Groundnut

(i) 827 Kg/ha. (ii) 92·5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of pods in Kg/ha.

| Treatment No. | 9 | 11 | 13 | 15 | 17 | 19 | 23 | 26 | 29 | 32 |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 768 | 826 | 907 | 682 | 855 | 833 | 788 | 818 | 937 | 853 |

C.D.=107·8 Kg/ha.

*Jowar*

(i) 1679 Kg/ha. (ii) 345·8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment No. | 4 | 5 | 6 | 7 | 16 | 18 | 20 | 22 | 24 | 28 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 1274 | 786 | 1014 | 1654 | 801 | 2564 | 1958 | 1606 | 2638 | 1382 | 2786 |

C.D.=401·4 Kg/ha.

Cotton

(i) 777 Kg/ha. (ii) 197·6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *Kapas* in Kg/ha.

| Treatment No. | 1 | 2 | 3 | 8 | 10 | 12 | 14 | 21 | 25 | 27 | 31 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 1050 | 946 | 697 | 739 | 479 | 690 | 894 | 746 | 746 | 822 | 733 |

C.D.=229·4 Kg/ha.

**61(79)**

Groundnut

(i) 1808 Kg/ha. (ii) 218·9 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of pods in Kg/ha.

| Treatment No. | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 25 | 28 | 31 |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 1405 | 2096 | 1778 | 1269 | 1900 | 1853 | 1895 | 1659 | 2025 | 2205 |

C.D.=254.6 Kg/ha.

*Jowar*

(i) 1863 Kg/ha. (ii) 573·8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment No. | 4 | 5 | 6 | 8 | 15 | 17 | 19 | 21 | 26 | 27 | 32 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 1824 | 1425 | 1422 | 1910 | 992 | 2374 | 1490 | 2055 | 2457 | 2173 | 2369 |

C.D.=665·7 Kg/ha.

Cotton

(i) 246 Kg/ha. (ii) 93·8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *Kapas* in Kg/ha.

| Treatment No. | 1 | 2 | 3 | 7 | 9 | 11 | 13 | 23 | 24 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 214 | 236 | 229 | 249 | 210 | 229 | 362 | 340 | 171 | 291 | 177 |

C.D.=108·9 Kg/ha.

62(91)

Groundnut

(i) 1075 Kg/ha. (ii) 143·8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of pods in Kg/ha.

| Treatment No. | 9 | 11 | 13 | 15 | 17 | 19 | 21 | 24 | 27 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 901 | 1194 | 1045 | 888 | 1024 | 1020 | 1109 | 1059 | 1216 | 1292 |

C.D.=167·4 Kg/ha.

*Jowar*

(i) 1781 Kg/ha. (ii) 427·8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment No. | 4 | 5 | 6 | 7 | 16 | 18 | 20 | 23 | 25 | 29 | 31 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 1895 | 1265 | 1366 | 1911 | 1028 | 2372 | 1685 | 1517 | 2407 | 1636 | 2505 |

C.D.=496·3 Kg/ha.

Cotton

(i) 558 Kg/ha. (ii) 164·6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *Kapas* in Kg/ha.

| Treatment No. | 1 | 2 | 3 | 8 | 10 | 12 | 14 | 22 | 26 | 28 | 32 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 745 | 570 | 432 | 544 | 364 | 546 | 632 | 475 | 540 | 690 | 603 |

C.D.=191·0 Kg/ha.

63(90)

Groundnut

(i) 455 Kg/ha. (ii) 60·0 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of pods in Kg/ha.

| Treatment No. | 10 | 12 | 14 | 16 | 18 | 20 | 23 | 26 | 29 | 32 |
|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 327 | 509 | 428 | 340 | 452 | 462 | 507 | 414 | 586 | 522 |

C.D.=69·8 Kg/ha.

*Jowar*

(i) 737 Kg/ha. (ii) 166·1 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment No. | 4 | 5 | 6 | 8 | 15 | 17 | 19 | 22 | 24 | 28 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 755 | 514 | 500 | 694 | 497 | 1032 | 779 | 690 | 999 | 652 | 992 |

C.D.=192·7 Kg/ha.

Cotton

(i) 266 Kg/ha. ii) 64·4 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of *Kapas* in Kg/ha.

| Treatment No. | 1 | 2 | 3 | 7 | 9 | 11 | 13 | 21 | 25 | 27 | 31 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Av. yield | 369 | 357 | 236 | 273 | 185 | 256 | 246 | 258 | 213 | 299 | 236 |

C.D.=74·8 Kg/ha.

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**Crop :- As Per Rotation.** **Ref :- Ms. 63(120).**

**Site :- Agri. Res. Stn., Dharwar.** **Type :- 'R'.**

Object :—To find out suitable crops that can be rotated with Cotton.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) 62·8 Q/ha. of F.Y.M. (ii) Deep black cotton soil. (iii) Cotton 1.8.63 ; Groundnut 1.7.63 ; *Jowar* 11.7.63 and wheat 10.2.64. (iv) (a) 2 ploughings, cross ploughing and 3 harrowings. (b) to (e) N.A. (v) Nil. (vi) Cotton—Jayadhar, N.A. for others (vii) Unirrigated. (viii) 3 interculturings and 3 weedings. (ix) 50 cm. (x) 18.12.63 to 10.2.64.

2. TREATMENTS :

9 crop rotations : $R_1$=*Jowar*-cotton, $R_2$=Cotton-*Jowar*, $R_3$=*Jowar*-cotton, $R_4$=Groundnut-*Jowar*, $R_5$=Cotton-groundnut, $R_6$=*Jowar*-cotton, $R_7$=Groundnut-*Jowar*, $R_8$=Wheat-groundnut and $R_9$=Cotton-wheat.

62·8 Q/ha. of F.Y.M. applied to *Jowar* at preparatory tillage, top dressing of *Jowar* at 28·0 Kg/ha. of N as A/S+28·0 Kg/ha. of $P_2O_5$ as Super, cotton at 22·4 Kg/ha. of N as A/S+11·2 Kg/ha. of $P_2O_5$ as Super and groundnut at 11·2 Kg/ha. of N as A/S+28·0 Kg/ha. of $P_2O_5$ as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6·1 m.×7·0 m. (v) 2 rows alround. (vi) Yes.

4. GENERAL :

(i) Fair (ii) Nil. (iii) Yield of grain, pods and *Kapas*. (iv) (a) N.A. (b) and (c) Nil. (v) to (vii) N.A.

5. RESULTS :

Cotton

(i) 514 Kg/ha. (ii) 179·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of *Kapas* in Kg/ha.

| Treatment | $R_1$ | $R_3$ | $R_6$ |
|---|---|---|---|
| Av. yield | 481 | 527 | 533 |

*Jowar*

(i) 1656 Kg/ha. (ii) 297·2 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

| Treatment | $R_2$ | $R_4$ | $R_7$ |
|---|---|---|---|
| Av. yield | 2099 | 1543 | 1327 |

C.D.=433·6 Kg/ha.

Groundnut

(i) 2440 Kg/ha. (ii) 463·7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pods in Kg/ha.

| Treatment | $R_5$ | $R_8$ |
|---|---|---|
| Av. yield | 2385 | 2496 |

Wheat

| Treatment | $R_9$ |
|---|---|
| Av. yield in Kg/ha. | 393 |

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**Crop :- As Per Rotation.** **Ref :- Ms. 63(124).**

**Site :- Agri. Res. Stn., Gadag.** **Type :- 'R'.**

Object :—To determine a suitable crop that can be grown in rotation with Cotton.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) 62·8 Q/ha. of F.Y.M. (ii) Medium black cotton soil. (iii) Setaria—29.10.63; Groundnut—30.10.63; *Jowar*—17.12.63 and Cotton—N.A. (iv) (a) 4 harrowings and opening furrows. (b) Dibbled in furrows. (c) N.A. (d) 30 cm. between rows. (e) N.A. (v) 62·8 Q/ha. of F.Y.M. (vi) Cotton—*Laxmi*, N.A. for others. (vii) Unirrigated. (viii) Weeding. (ix) 53 cm. (x) 29.10.63 to 17.3.64.

2. TREATMENTS:

6 crop rotations : $R_1$=*Jowar*—Cotton, $R_2$=Cotton—*Jowar*, $R_3$=Groundnut—Cotton, $R_4$=Cotton—Groundnut, $R_5$=Setaria—Cotton and $R_6$=Cotton—Setaria.

62·8 Q/ha. of F.Y.M. applied to *Jowar* in preparatory tillage. Top dressing after sowing for *Jowar*+Setaria—16·8 Kg/ha. of N as A/S, for Groundnut—11·3 Kg/ha. of N as A/S+22·6 Kg/ha. of $P_2O_5$ as Super and for Cotton—28·0 Kg/ha. of N as A/S+28·0 Kg/ha. of $P_2O_5$ as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 12·2 m.×5·5 m. (b) 11·6 m.×4·5 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of grain, pods and *kapas*. (iv) (a) and (b) N.A. (c) Nil. (v) Dharwar and Bagalkot. (vi) Scarcity of rainfall. (vii) As the analysis is possible for cotton crop only, for other crops the average yield has been given in 5. Results.

5. RESULTS:

Cotton

(i) 257 Kg/ha. (ii) 82·1 Kg/ha. (iii) Treament differences are not significant. (iv) Av. yield of *kapas* in Kg/ha.

| Treatment | $R_1$ | $R_3$ | $R_5$ |
|---|---|---|---|
| Av. yield | 298 | 272 | 201 |

*Jowar* : $R_2$=462 Kg/ha. ; Groundnut : $R_4$=240 Kg/ha. ; Setaria : $R_6$=182 Kg/ha.

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**Crop :- As Per Rotation.** **Ref :- Ms. 63(125).**

**Site :- Agri. Res. Stn., Bagalkot.** **Type :- 'R'.**

Object :—To determine suitable crops that can be grown in rotation with Cotton.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) 62·8 Q/ha. of F.Y.M. (ii) Medium black cotton soil. (iii) Cotton—4.9.63; Groundnut, Setaria and *Jowar*—13.8.63. (iv) (a) Ploughing and cross ploughing twice, harrowing and levelling. (b) Dibbled in furrows. (c) and (d) 30 cm. between rows. (e) N.A. (v) 62·8 Q/ha. of F.Y.M. applied at tillering stage. (vi) Suyodhar. (vii) Unirrigated. (viii) 2 intercultivations and 3 weedings. (ix) 40 cm. (x) Groundnut 12.11.63; Setaria 11.11.63; *Jowar* 19.2.64 and Cotton 3.3.64 and 31.3.64.

2. TREATMENTS and 3. DESIGN :

Same as in expt no. 63(124) on page 622.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield data. (iv) (a) N.A. (b) No. (c) Nil. (v) N.A. (vi) and (vii) N.A.

5. RESULTS :

(i) 338 Kg/ha. (ii) 61·7 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield in Kg/ha.

| Treatment | $R_1$ | $R_2$ | $R_3$ | $R_4$ | $R_5$ | $R_6$ |
|---|---|---|---|---|---|---|
| Av. yield | 374 | 397 | 383 | 165 | 355 | 354 |

C.D.=73·3 Kg/ha.

---

**Crop :- Cotton (*Rabi*).** **Ref :- Ms. 64(115).**

**Site :- Agri. Res. Stn., Naragund.** **Type :- 'M'.**

Object : —To study the effect of different doses of Sulphur with and without F.Y.M. for the reclamation of alkaline soils on the yield of Cotton and Wheat grown in rotation.

1. BASAL CONDITIONS :

(i) (a) Wheat-Cotton. (b) Wheat. (c) As per treatments under item 2. (ii) Light to medium black. (iii) 23.9.64. (iv) (a Harrowing. (b) Seed drilling. (c) 11·2 Kg/ha. (d) 76 cm. (e) N.A. (v) 56 Q./ha. F.Y.M. (vi) Jayadar. (vii) Unirrigated. (viii) Hand weeding and 4 times interculturing by entire hoe. (ix) 107 cm. (x) 5, 1.3.65, 5.4.65.

2. TREATMENTS:

**Main-plot treatments**

2 rotation treatments : $R_1$=Sulphur applied to both the crops, $R_2$=Sulphur applied to cotton only.

**Sub-plot treatments**

All combinations of (1) and (2)

(1) 3 doses of Sulphur : $S_0=0$, $S_1=168$ and $S_2=336$ Kg/ha.
(2) 2 doses of F.Y.M. : $F_0=0$ and $F_1=56$ Q/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6·1 m. ×11·0 m. (b) 4·6 m.×[illegible]·8 m. (v) 76 cm.×61 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) No. of plants, boll count and yield data. (iv) (a) 1959, 60(147), 61(145), 62(135). 63(119) contd. (b) Yes. (c) Nil. (v) to(vii) Nil.

5. RESULTS :

(i) 486 Kg/ha. (ii) (a) 209·3 Kg/ha. (b) 113·6 Kg/ha. (iii) F effect is significant. S effect is highly significant. (iv) Av. yield of grain in Kg/ha.

| | $F_0$ | $F_1$ | $S_0$ | $S_1$ | $S_2$ | Mean |
|---|---|---|---|---|---|---|
| $R_1$ | 439 | 546 | 393 | 509 | 575 | 492 |
| $R_2$ | 454 | 505 | 365 | 525 | 549 | 480 |
| Mean | 446 | 526 | 379 | 517 | 562 | 486 |
| $S_0$ | 373 | 385 | | | | |
| $S_1$ | 459 | 575 | | | | |
| $S_2$ | 507 | 617 | | | | |

C.D. for S marginal means =82·1 Kg/ha.
C.D. for F Marginal means=67·0 Kg/ha.

---

**Crop :- Cotton & Wheat (*Rabi*).** **Ref :- Ms. 65(103).**
**Site :- Agri. Res. Stn., Naragund.** **Type :- 'X'.**

Object :—To study the effect of different doses of sulphur with and without F.Y.M. for the [illegible]clamation of karl soil.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat and cotton respectively. (c) As per treatments. (ii) Alkaline. (iii) [illegible]otton 22.9.65; wheat 3.11.65. (iv) (a) Harrowing 2 times for wheat and 3 times for coton plots. (b) S[illegible]d drill sowing. (c) Cotton 11·2 Kg/ha; wheat 44·8 Kg/ha. (d) Cotton 76 cm. and wheat 36 cm. betwe[illegible] lines. (e) N.A. (v) Nil. (vi) Wheat —Amrut (90 to 100 days); cotton—Jayadhar (14[illegible] days). (vii) Uni[illegible]gated. (viii) Interculturing to cotton only by hoe. (ix) 36·8 cm. (x) Wheat 20.2.66; coton 18.2.66 to 26.3[illegible]

2. TREATMENTS :

**Main-plot treatments**

2 rotational treatments : $R_1$=Cotton and wheat/$R_2$=Coton only.

**Sub-plot treatments**

All combinations of (1) and (2)

(1) 2 levels of F.Y.M. : $F_0$=0 and $F_1$=12·4 C.L./ha.

(2) 3 doses of Sulphur : $S_0$=0, $S_1$=168, and $S_2$=336 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plos/replication ; 6 sub plots/main plot. (b) N.A. (iii) 4. (iv) (a) 6·1 m.× 11·9 m. (b) 4·6 m.×9·8 m. (v) [illegible]6 cm.×6[illegible] cm. (vi) Yes.

4. GENERAL :

(i) Normal for cotton. N.A. for wheat. (ii) Nil. (iii) Yield data. (iv) (a) 64-contd. 64(92). (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :

Cotton

(i) 303 Kg/ha. (ii) (a) 271·7 Kg/ha. (b) 84·0 Kg/ha. (iii) Main effect of S alone is highly significant. (iv) Av. yield of *Kapas* in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $F_0$ | $F_1$ | Mean |
|---|---|---|---|---|---|---|
| $R_1$ | 162 | 277 | 359 | 228 | 304 | 266 |
| $R_2$ | 252 | 345 | 421 | 329 | 349 | 339 |
| Mean | 206 | 311 | 390 | 279 | 326 | 302 |
| $F_0$ | 197 | 287 | 351 | | | |
| $F_1$ | 216 | 335 | 429 | | | |

C.D. for S marginal means=49·4 Kg/ha.

Wheat

(i) 159 Kg/ha. (ii) (a) 148·8 Kg/ha. (b) 62·7 Kg/ha. (iii) Main effect of S alone is significant. (iv) Av. yield of grain in Kg/ha.

| | $S_1$ | $S_2$ | $S_3$ | $R_0$ | $R_1$ | Mean |
|---|---|---|---|---|---|---|
| $R_1$ | 126 | 159 | 207 | 163 | 164 | 164 |
| $R_2$ | 114 | 203 | 147 | 158 | 152 | 155 |
| Mean | 120 | 181 | 176 | 160 | 158 | 159 |
| $F_0$ | 118 | 173 | 191 | | | |
| $F_1$ | 122 | 189 | 162 | | | |

C.D. for S marginal means =36·9 Kg/ha.

INDEX (Crop-wise and type-wise) (Page Number)

| Type / Crop | M | MV | C | CV | CM | CMV | I | IM | IC | ICV | D | DM | X | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Paddy | 1 | 80 | 85 | 102 | 114 | 123 | 124 | — | — | — | 126 | — | — | — |
| Wheat | 134 | — | 150 | 152 | 153 | — | — | 155 | — | — | — | — | — | — |
| Jowar | 159 | 212 | 214 | 223 | 226 | 230 | — | 231 | — | 232 | 234 | — | — | — |
| Bajra | 238 | — | 242 | 243 | — | — | — | — | — | — | 244 | — | — | — |
| Maize | 245 | 248 | — | 250 | — | 250 | — | 252 | — | — | — | — | — | — |
| Ragi | 257 | — | 274 | — | — | 278 | — | — | — | — | 279 | — | — | — |
| Korra | 280 | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Gram | 283 | — | — | — | — | — | — | 284 | — | — | — | — | — | — |
| Green Gram | — | — | 287 | — | — | — | — | — | — | — | — | — | — | — |
| Tur | — | — | — | — | — | — | — | — | — | — | 287 | — | — | — |
| Potato | 288 | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sugarcane | 292 | 330 | 330 | 336 | 337 | — | 347 | 350 | — | — | 355 | — | — | — |
| Cotton | 361 | — | 407 | 416 | 418 | — | 433 | 434 | 436 | — | 439 | 454 | — | — |
| Tobacco | 459 | — | 472 | — | — | — | — | — | — | — | 474 | — | — | — |
| Groundnut | 477 | — | 503 | 513 | — | — | 516 | — | — | — | 516 | 517 | — | — |
| Caster | 518 | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Grass | 520 | 523 | 524 | 526 | — | — | — | — | — | — | — | — | — | — |
| Cordmum | — | — | 529 | — | — | — | — | — | — | — | 532 | — | — | — |
| Pepper | — | — | 532 | — | — | — | — | — | — | — | — | — | — | — |
| Chillies | 534 | 535 | — | — | — | — | — | — | — | — | — | — | — | — |
| Citrus | 536 | — | 537 | — | — | — | — | 547 | 548 | — | 550 | — | — | — |
| Coffee | 551 | — | 575 | — | 580 | — | — | 587 | — | — | 588 | — | — | — |
| Cashewnut | — | — | 597 | — | — | — | — | 599 | — | — | — | — | — | — |
| Arecanut | 600 | — | 605 | — | — | — | — | — | — | — | — | — | — | — |
| Coconut | — | — | — | — | 609 | — | — | — | — | — | — | — | — | — |
| Mixed cropping | — | — | — | — | — | — | — | — | — | — | — | — | 609 | — |
| Rotational | — | — | — | — | — | — | — | — | — | — | — | — | — | 617 |

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